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THERMAL ANALYSIS OF PANSAT BATTERIES AND ELECTRICAL POWER SUBSYSTEM

by

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Submitted in partial fulfillment
of the requirements for the degree of

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ABSTRACT

The thermal design of a spacecraft ensures proper heat transfer so all components and subsystems remain within prescribed temperature limits during all aspects of the spacecraft's mission. This thesis develops a point-to-point heat flow model of the Electrical Power Subsystem (EPS) and its associated housing for the Petite Amateur Navy Satellite (PANSAT). The analysis is performed to identify physical locations in the EPS where temperature may exceed the limits established to protect sensitive electronic components, and to define the expected environment of the batteries. The Integrated Thermal Analysis System (ITAS) and a Steady State Thermal Analyzer and Model Builder were used to perform steady state and transient analyses on the EPS; analysis of the batteries was performed using ITAS only. The simulated transient temperatures within the EPS housing remained within limits, but the batteries exceeded specifications. It is suggested that a passive thermal control technique be adapted for the batteries and its design be experimentally validated before flight.

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I. INTRODUCTION

A. REASON FOR ANALYSIS

The thermal environment for components within a spacecraft is a function of the irradiation from the sun and earth, internal heat dissipation, radiation from external surfaces to the space sink, and the conductive and radiatitive heat transfer paths between the heat sources and sinks. Thermal control design ensures proper heat transfer so that all components and subsystems remain within prescribed temperature limits during all aspects of the spacecraft's mission.[Larson and Wertz, 1992] Early thermal design forces the determination of operating temperature limits and identifies the power dissipation patterns of components to allow for maximum use of passive thermal control methods.

To build a thermal model of a spacecraft, a knowledge of dimensions, equipment placement and material properties is required. The spacecraft or area to be analyzed is divided into nodes. The nodes are chosen so that the conductive and radiative heat flow paths accurately represent point-to-point heat flows within the spacecraft.

The thermal design of the spacecraft is also highly dependent on the mission and stabilization system of the satellite. Typically unmanned, low earth orbit spacecraft can be controlled passively. Table 1 lists a typical operating environment for electric power system (EPS) components.

The power subsystem typically has the greatest interaction with the thermal control subsystem because all of the dissipated electrical energy within the spacecraft must be radiated into space. The terrestrial batteries to be used in the Petite Amateur Navy Satellite (PANSAT) have even a narrower temperature range than that listed in Table 1: the ideal operational

SYSTEM COMPONENT	TEMPERATURE RANGE
MILITARY PIECE PARTS FOR INTEGRATED CIRCUITS	-55 TO 125 DEGREES CELSIUS
BATTERIES	-6 TO 26 DEGREES CELSIUS
SOLAR ARRAY PANELS	-100 TO 100 DEGREES CELSIUS

Table 1. Temperature Ranges for Some Electrical Power System Components

temperature for charging and discharging is 23 °C. Operations outside the published temperature range will cause the battery cells to degrade and become less efficient. This condition is explained fully in Chapter VI.

PANSAT has a very low power margin and must be able to maximize the power from the solar arrays and batteries. The sunlight and shadow zones of the orbit require that the batteries must operate for 40 percent of the time. There is only one EPS box for PANSAT. Other vital subsystems are redundant ; for example, the Digital Control Subsystem has two fully capable boxes. The batteries within the Electrical Power Subsystem itself are redundant, but must be able to be recharged to full capacity after each use to ensure proper Depth of Discharge. The batteries and the EPS will be discussed more fully in the following chapters.

B. SCOPE OF THESIS

The purpose of this thesis is to develop a transient thermal model of the Electrical Power System and the associated housing for the Petite Amateur Navy Satellite (PANSAT) . This thesis will also develop a steady state and transient analysis for the preliminary Nickel-Cadmium battery design, identifying any physical locations within the EPS and batteries where temperature limits are exceeded, and offering some recommendations for

passive thermal methods. Computer generated steady state and transient analyses using radiation, contact conductances and thermal capacitances through the equipment housing and the upper and lower equipment plates of the satellite were used to evaluate temperature ranges at the node points representing physical locations in the structure. To perform the analysis, circuit board layouts, heat dissipations of components, subsystem materials and cell efficiencies were required. Inward viewing box geometry was used to physically model the EPS and the battery model. Two models were used to verify steady state temperatures for the EPS. The transient analyses used equipment plate temperature profiles obtained from a recent transient analysis of the entire PANSAT structure.

II. BACKGROUND

A. PETITE AMATEUR NAVY SATELLITE (PANSAT)

PANSAT was initiated in 1989 to provide interdisciplinary educational opportunities in space related areas to prepare postgraduate students for follow on work in space systems acquisition and design, and to develop a cadre of engineers and technicians at the Naval Postgraduate School (NPS) capable of developing and producing space qualified hardware. The current PANSAT design is the result of five years of research by NPS thesis students and the personnel of the Space Systems Academic Group (SSAG). Preliminary Design Review (PDR) was held in 1993 with the Critical Design Review to be held in late 1994.

The payload will be a direct sequence spread spectrum with a differentially coded, binary phase shift keyed (BPSK) communications system with an operating frequency of 436.5 MHz. The satellite will relay messages on a user-to-user basis in a simplex mode. The store and forward communication will allow amateur radio operators to send and receive messages through several short windows daily.[FRD, 1993]

The spacecraft will weigh approximately 150 pounds and is being designed to launch as a secondary platform from the space shuttle as part of the Hitchhiker Program. PANSAT has no attitude control and is free to tumble. Operational life is expected to be two years, with three to five minute communications segments per orbital pass. PANSAT will operate between 28.5° and 51.6° inclination and between 160-220 nautical miles.

The spacecraft consists of five subsystems: Communication (COMM), Electrical Power, Computer, Structure, and Ground Station Support. This

thesis focuses on the Electrical Power Subsystem, where the thermal control functions reside.

The PANSAT structure is Aluminum 6061-T6, built about a main load bearing cylinder connected to a lower equipment plate. The satellite is a tumbler, and since the solar panels will be mounted on the spacecraft skin, maximizing surface area increases power generation. A 26 sided polyhedron was the chosen structural configuration, already demonstrated on a Shuttle launch. A view of PANSAT is shown in Figure 1.

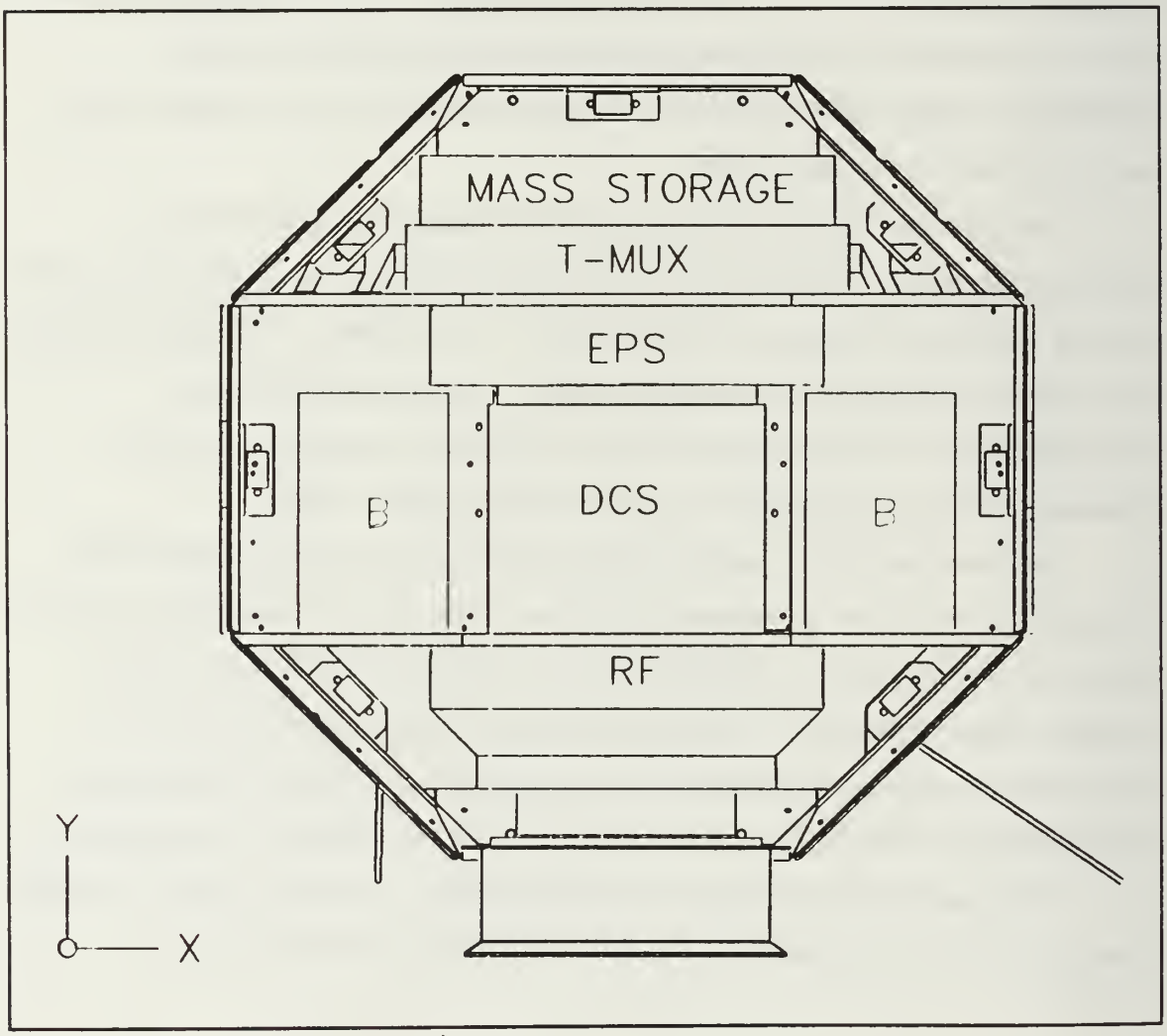


Figure 1. PANSAT Design

B. ELECTRICAL POWER SYSTEM (EPS)

The power to PANSAT is provided by seventeen 256 cm ^{2} solar panels consisting of silicon (Si) solar cells. The solar cells are K6700 Si cells connected in series in 4 strings of 8 cells each. The EPS also consists of electrical components needed to generate, regulate, and provide ± 15 V and +5 V power for the various power control electronics. In eclipse, two Nickel-Cadmium batteries of ten cells each maintain the bus voltage at 12 Vdc. The EPS control interface provides the power switching of all modules on the printed circuit boards (PCBs) in the Digital Control Subsystem (DCS) and COMM. The watchdog timer in the EPS is used to reset the DCS in the event of a failure. The EPS is also dependent on the Ni-Cd batteries for voltage regulation during all modes of operation. An EPS block diagram developed by the SSAG is shown in Figure 2.

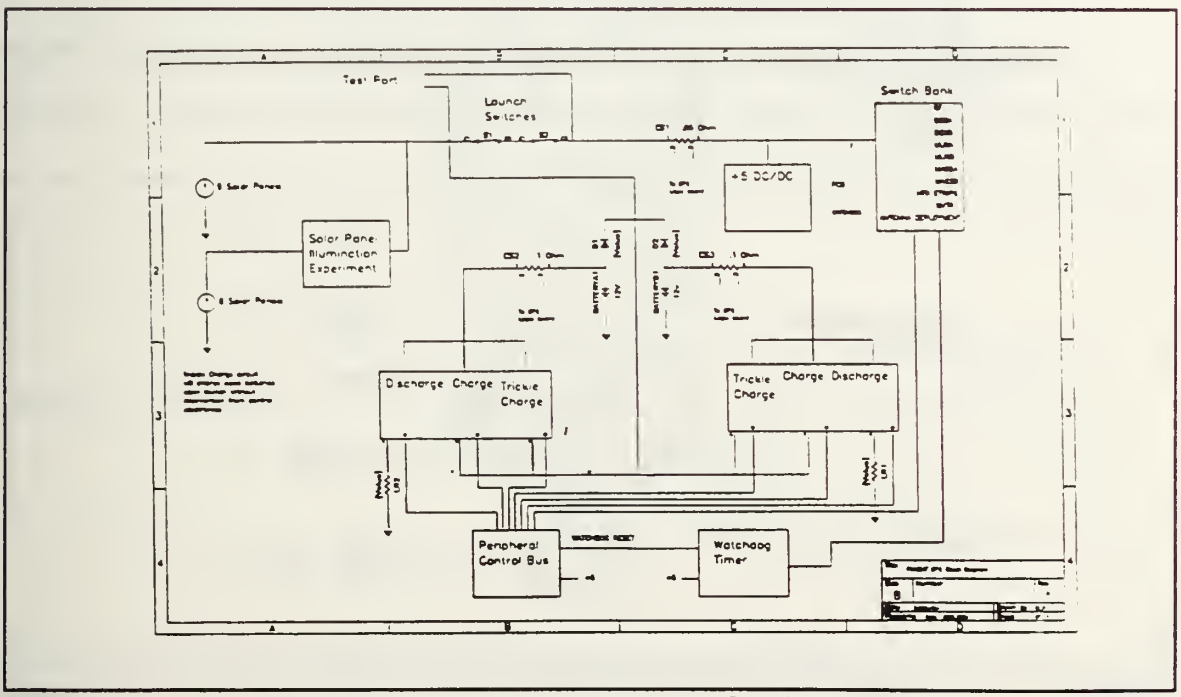


Figure 2. Electrical Power System Block Diagram

Voltage sensors monitor the solar panel bus and battery voltages, and thermal sensors monitor the temperature of the solar panels, batteries and electronics housings. Figure 3 shows the solar panels and box placement. The triangular panels of the satellite do not have solar panels and could be used for passive thermal control if required. The EPS is mounted underneath the upper equipment plate, and above the DCS and batteries, which are mounted on the top of the lower equipment plate.

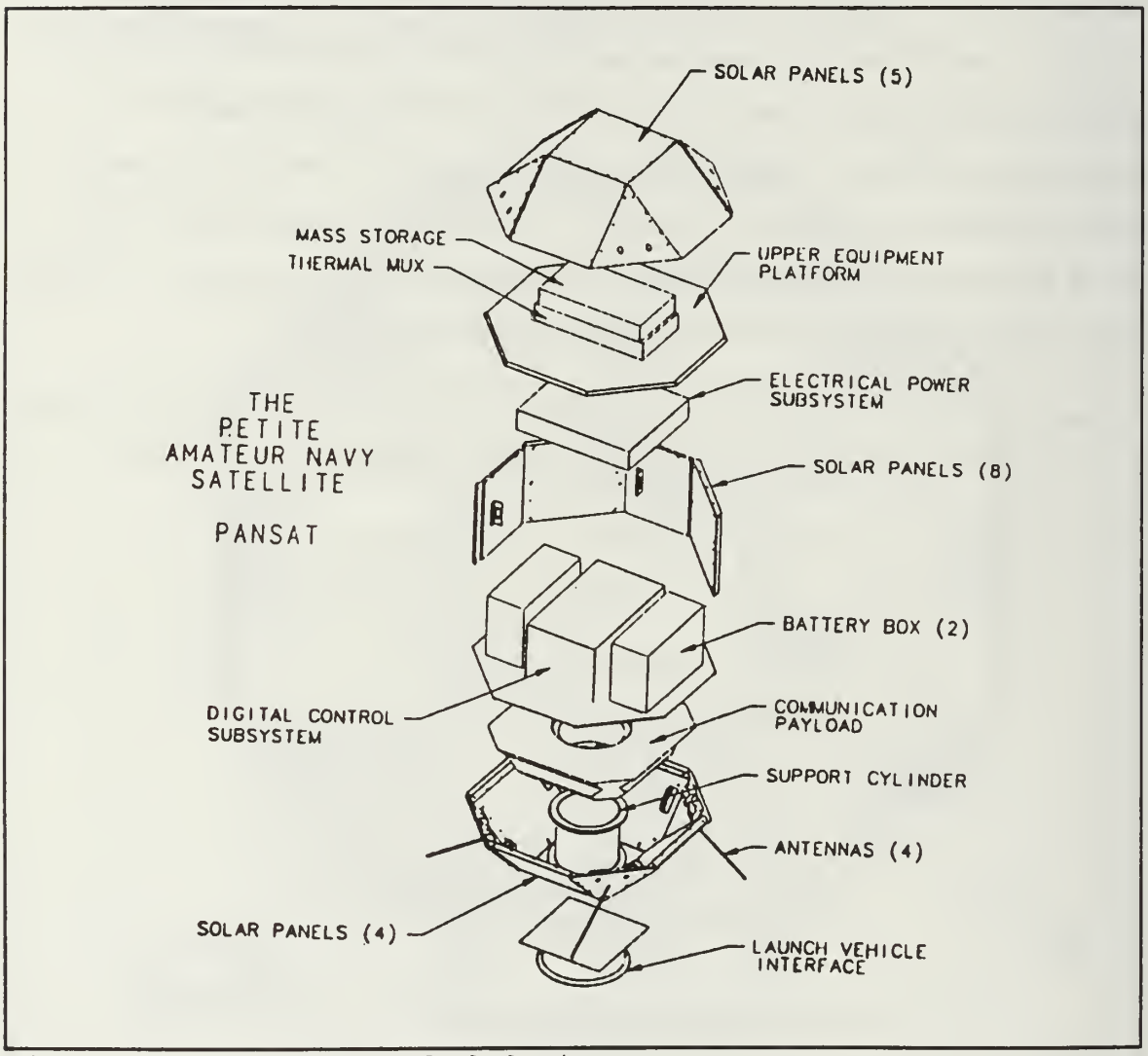


Figure 3. PANSAT Exploded View

PANSAT Design requirements include:

- 21.5 Watts at 15.2 Vdc average minimum electrical power at end of life (EOL)

- Minimum of 60 percent power conversion efficiency

- 12 Volt regulated bus

- Nickel-Cadmium batteries with a 10 percent Depth of Discharge (DOD)

- Mission life of 24 months [FRD, 1993]

Terrestrial Ni-Cd batteries are the chosen type due to high energy density, cycle life and reliability. Space rated batteries will not be used because of their prohibitively high cost. Figure 4 shows the proposed F-cell,

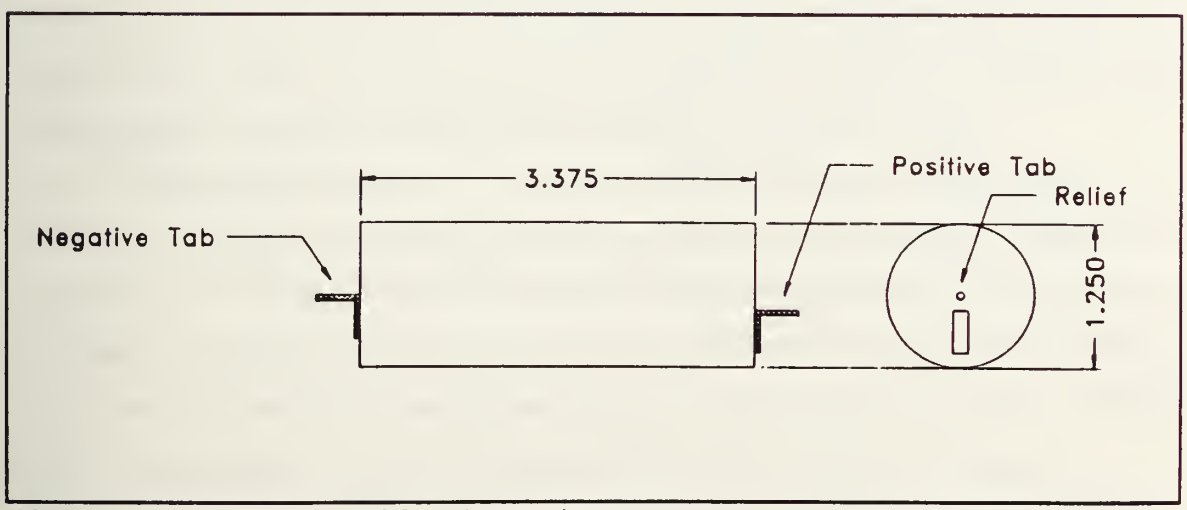


Figure 4. Ni-Cd Cell Dimensions

its 32 psi pressure relief valve and the cell dimensions. Although the F-cell has a pressure relief valve it is still considered a closed cell. The batteries will be fully discussed in Chapter VI.

III. STEADY STATE THERMAL ANALYSIS

A. BACKGROUND

A nodal analysis based on a finite difference model of PANSAT structure was performed in 1992 using the Intercept Thermal Analyzer Software Package. Input into the analyzer program is written by a model builder program which can be saved for modification for later use. THANSS is the model builder and the thermal analyzer is TASS. TASS provides the solution of Equation 3.1 using the Cholesky reduction in an iterative scheme

$$[A] \; x \; [T] = [B] \qquad 3.1$$

to solve for T (the node temperature vector). THANSS uses conductance paths to generate node to node conductances to form a set of heat balance equations (Equations 3.2, 3.4, and 3.13) where A is the matrix of conductances and B is a column vector of constant temperatures and heat inputs. The node temperatures obtained after each iteration are used to update the temperature dependent terms in the A matrix. This process continues until the change in the nodal temperatures between successive iterations is smaller than 0.05. When the iterative solution is obtained, the temperatures are then written into an output file. [Kraus, 1990]

This analysis resulted in a steady state temperature map of the PANSAT structure (including the square panels where the solar panels are mounted, the triangular panels, and both equipment plates). To accurately model the structure, the square panels were divided into nine equal nodes, the triangular panels were divided into six nodes, and the equipment plates eight nodes each. The model connects the nodes together through a network of user defined conduction paths and connects individual nodes

through constant temperature sinks through conduction and radiation. Results of the steady state analysis for sunlight and shadow zones both with internal heat dissipation are shown in Appendix A.

Conductance values are either calculated or input by the analyst from separate calculations. There are ten different modes that can be selected to characterize node-to-node heat flow. Three of these methods were used for analysis of the Electrical Power System: heat flow between nodes for conduction (method designator 1), heat flow between nodes for radiation (method designator 3), and a constant heat input (method designator 10). The heat balance equation for conduction is

$$q = K_1 \ (T_2 - T_1) \qquad 3.2$$

with the conductance, K_1 determined from the Fourier Law and [A] = [K]

$$K_1 = k \ \frac{A}{\Delta L} \qquad 3.3$$

where q is the heat flow, T_1 and T_2 define the node-to-node temperature difference for the path, k is the thermal conductivity of the material in Btu / ft - hr - °F or W/m° C, A is the cross sectional area for heat flow and L is the length of the heat flow path. The units of the conductance are Btu/hr ° F or W / ° C.

The heat flow equation by radiation is governed by the Stefan-Boltzmann Law shown in Equation 3.4.

$$q = \sigma \ F_A \ F_\epsilon \ A(T_2^4 - T_1^4) \qquad 3.4$$

or

$$q = k_3 (T_2 - T_1) \qquad 3.5$$

where

$$K_3 = \sigma F_A F_\epsilon A (T_2 + T_1) (T_2^2 + T_1^2) \qquad 3.6$$

Equation 3.6 derives from the fact that $T_2^4 - T_1^4$ can be written as the sum and difference of squares

$$(T_2^4 - T_1^4) = (T_2^2 + T_1^2)(T_2^2 - T_1^2) = (T_2^2 + T_1^2)(T_2 + T_1)(T_2 - T_1) \qquad 3.7$$

Here σ is the Stefan-Boltzmann constant (1.713×10^{-9} Btu/ft^2-R^4 or 5.669×10^{-8}W/m^2-K^4), F_A is the arrangement or shape factor and F_E is the emissivity factor. For radiation between two non-black surfaces, (where a blackbody is a perfect absorber and emitter of radiation), the emissivity and absorptivity of the surfaces will not be equal to 1. The departure from ideal surfaces for two infinite plates in full view of one another is

$$F_E = \frac{1}{\frac{1}{\epsilon_1} + \frac{1}{\epsilon_2} - 1} \qquad 3.8$$

where ϵ_1 is the emissivity of the first plate and ϵ_2 is the emissivity of the second plate. [Class notes AA 3804, July 1993] This closely approximates the configuration of the two printed circuit boards (PCBs) in the EPS. The shape factor (F_A) accounts for the situation where the alignment of the surfaces prevents the interception of all of the emissions from the source. Other terms used to describe the shape factor include view, configuration and arrangement factor.

For radiation, TASS handles the heat flow by developing K_3 to permit the use of a linear temperature difference (Equation 3.9)

$$q_r = K(T_2 - T_1) \qquad 3.9$$

by computing K_3 from

$$K_3 = \frac{\sigma A F_A F_E (T_2^4 - T_1^4)}{T_2 - T_1}$$

$$= \frac{\sigma A F_A F_E (T_2^2 + T_1^2)(T_2^2 - T_1^2)}{T_2 - T_1}$$

$$= \frac{\sigma A F_A F_E (T_2^2 + T_1^2)(T_2 + T_1)(T_2 - T_1)}{T_2 - T_1} \qquad 3.10$$

so that K_3 is indeed

$$K = \sigma A F_A F_E (T_2^2 + T_1^2)(T_2 + T_1) \qquad 3.6$$

Because heat transfer by radiation is governed by

$$q = \sigma F_A F_E A (T_2^4 - T_1^4) \qquad 3.4$$

the conductance value is entered by the user so that

$$q = K(T_2 - T_1) \qquad 3.11$$

The user needs only to enter the value
and TASS handles the computation in accordance with Equation 3.6.

$$K = \sigma F_A F_E A \qquad 3.12$$

When a node is to have a constant temperature input, a tag of 10 is entered and the connecting node is specified as 999. Thus the third method of heat flow is in the form

$$q = K_q \qquad 3.13$$

where K_q is a constant.

B. BOUNDARY CONDITIONS FOR EPS ANALYSIS

The steady state structural analysis of PANSAT was conducted in 1992 with the transient analysis of the structure completed in January 1994. The segmented panels (or nodes) were taken individually to determine the number of connections (also known as branches) to other nodes. The type of connection (i.e., the mode of heat transfer for conduction, radiation and constant temperature) is specified as the tag number for the particular branch. Tag is used to avoid confusion between node and mode. Constant temperatures are given node numbers, beginning with 301. A total of 983 conductances from 232 nodes determined the total PANSAT thermal model. When the thermal analysis was run, the first file was a summary of the final temperatures of all the nodes, and was followed by the node temperatures after each iteration.

Models were run for steady state conditions in sunlight and shadow with and without internal heat dissipation. The runs with heat dissipations were used because the satellite low power mode is not much less than the high power mode. Appendix A shows that for the steady state analysis for sunlight with internal heat dissipation the temperatures range from 45.3 °C to 60.2 °C. The steady state analysis in the shadow zone (Appendix B) with

internal heat dissipation resulted in a temperature range of -70.6 °C to 66.6°C.

A transient analysis for the satellite was performed a year later using the same nodes. Average temperatures for the upper equipment plate for the first fourteen orbits are plotted in Figure 5, and for the lower equipment plate in Figure 6. Starting temperature was assumed to be 25 ° C for Kennedy Space Center temperatures in October. Table 2 and Table 3 show the data breakout by node numbers for the upper equipment plate (nodes 211 to 218) and the lower equipment plate (node numbers 219 to 226). The average temperatures for the equipment plates were used as boundary conditions for the transient analysis of the Electrical Power System and the steady state and transient battery analysis.

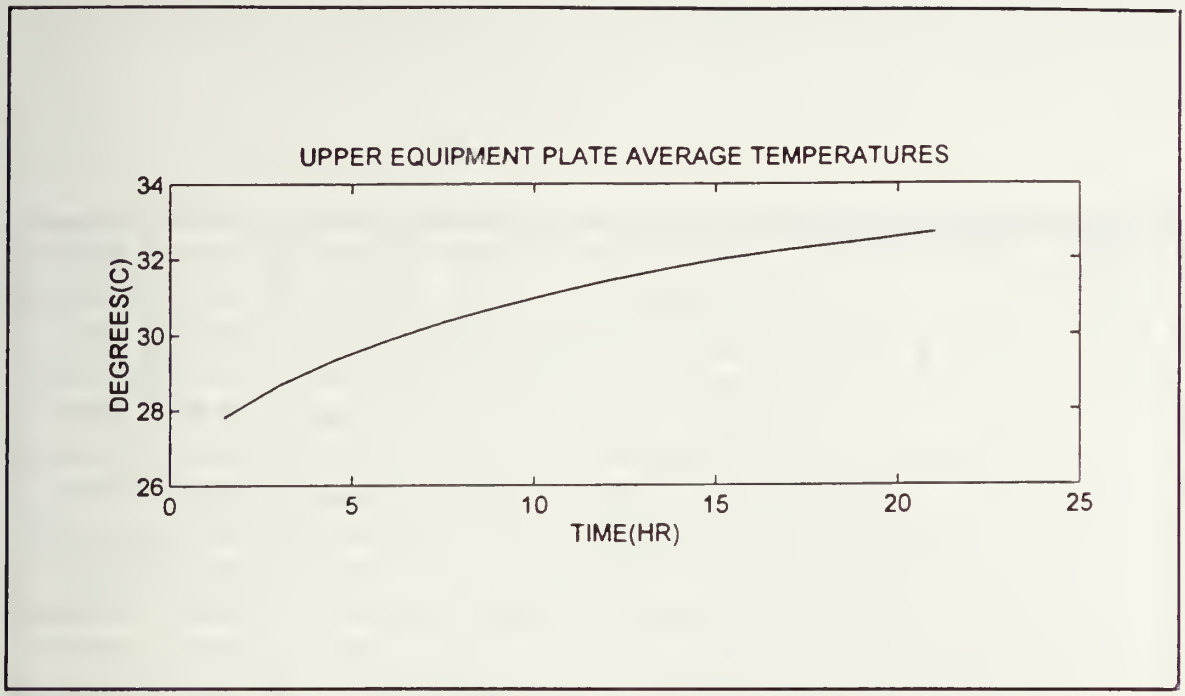


Figure 5. Upper Equipment Plate Average Temperatures

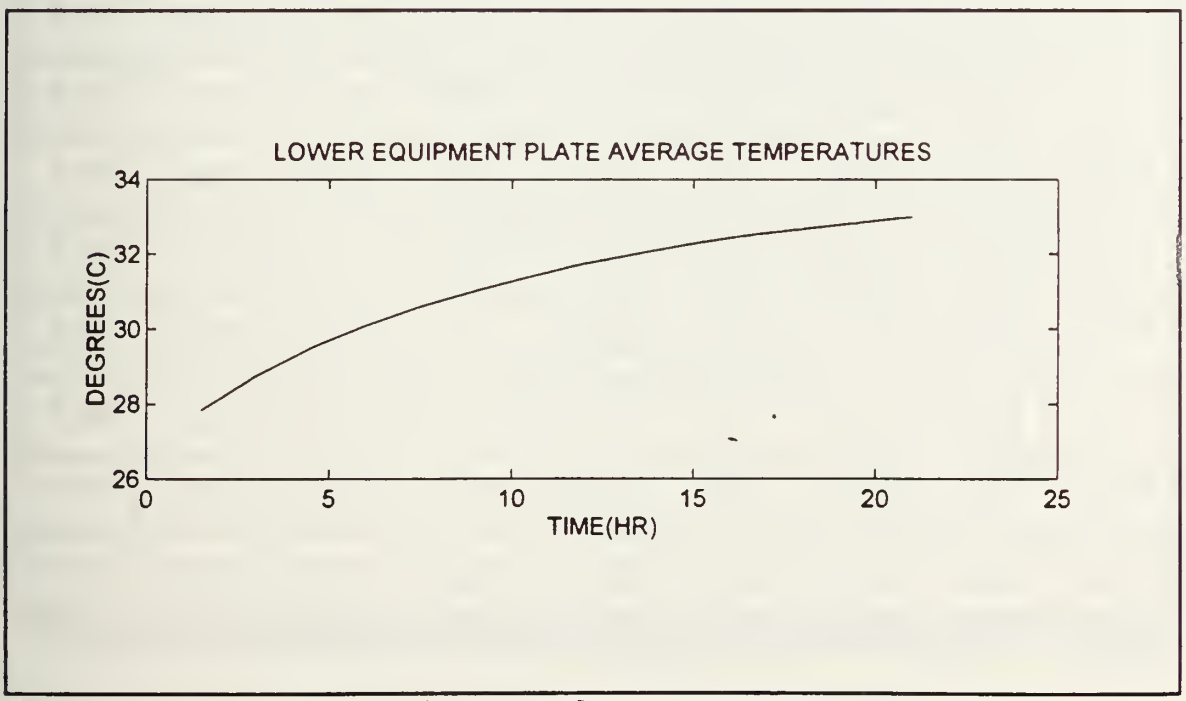


Figure 6. Lower Equipment Plate Average Temperatures

PASS	211	212	213	214	215	216	217	218
1	28.8	29.3	29.3	29.3	27.2	26.9	26.5	26.3
2	28.8	30.4	30.4	29.3	28.1	27.8	27.3	27.1
3	30.5	31.1	31.1	23.0	28.7	28.4	28.0	27.6
4	31.0	31.2	31.7	30.6	29.3	28.9	28.5	28.2
5	31.5	32.2	32.1	31.5	29.8	29.4	29.0	28.7
6	31.5	32.6	32.6	31.4	30.2	29.3	29.4	29.1
7	32.3	33.0	32.5	31.5	30.6	30.2	29.8	29.5
8	32.9	33.3	33.3	32.2	30.9	30.6	30.1	29.8
9	32.9	33.6	33.6	32.5	31.2	30.9	30.4	30.1
10	33.2	33.9	33.3	32.2	31.5	31.1	30.2	30.4
11	33.4	34.1	34.1	33.0	31.4	31.4	30.9	30.6
12	33.8	34.3	34.3	33.2	31.6	31.6	31.1	30.8
13	33.8	34.5	34.5	33.3	32.1	31.4	31.3	31.0
14	34.0	34.7	34.6	33.5	32.2	31.9	31.5	31.2

Table 2. Upper Equipment Plate Temperatures in Degrees C by Node

PASS	219	220	221	222	220	224	225	226
1	29.2	28.8	29.8	28.2	27.7	27.8	27.8	27.9
2	29.2	29.3	29.3	29.3	28.8	23.0	29.0	28.9
3	30.6	30.7	30.7	30.4	23.6	29.8	29.2	29.7
4	30.6	31.3	31.7	30.7	30.3	30.4	30.4	30.3
5	31.6	31.3	31.4	30.7	30.3	30.4	30.4	30.3
6	31.6	32.3	32.4	31.7	31.3	31.4	31.4	31.3
7	32.0	32.7	32.7	32.1	31.7	31.8	31.6	31.7
8	32.4	33.1	33.1	32.1	32.0	32.2	32.1	32.1
9	32.7	33.4	33.4	32.7	32.3	32.5	32.4	32.4
10	32.9	33.6	33.7	33.0	32.5	32.7	32.7	32.9
11	33.2	33.9	33.6	33.2	32.8	33.0	32.9	32.9
12	33.1	34.1	34.1	33.4	33.1	33.2	33.1	33.1
10	33.5	34.2	34.3	33.6	33.7	30.3	33.3	33.2
14	33.7	34.4	34.4	33.8	33.3	33.5	33.4	33.4

Table 3. Lower Equipment Plate Temperatures in Degrees C by Node

IV. STEADY STATE ANALYSIS OF THE EPS USING THANSS

A. PROCEDURE THEORY

A thermal resistance may be defined as the reciprocal of the conductance.

$$R = \frac{1}{K} \qquad 4.1$$

R is the resistance in ° F-hr/ Btu or ° C/W. This relationship does not apply exclusively to the conduction mode of heat transfer . If the analogy exists between the heat flow and the direct current statement of Ohm's Law

$$q = K \Delta T = \frac{\Delta T}{R} \qquad 4.2$$

then it is analogous to

$$I = \frac{\Delta V}{R_E} \qquad 4.3$$

where R_E is the electrical resistance and all of the d-c network thorems apply. The addition of thermal resistances in series and the combination of resistances in parallel are permitted operations. For example, the combination of two resistors in series is given by

$$R_C = R_A + R_B \qquad 4.4$$

and in parallel where R_C is the equivalent resistance.

$$R_C = \frac{R_A R_B}{R_A + R_B} \qquad 4.5$$

B. DESCRIPTION OF NODES

To simplify calculations and to assure accuracy in the node descriptions, the printed circuit boards were divided into 72 nodes with each node having an area of 1 square inch. This size results in relatively easy calculations when using areas and lengths between nodes and between printed circuit boards. The top board nodes were numbered 1-72 with the bottom board nodes numbered 73-144. Appendix C shows the node numbering, which will be used for reference later in this chapter.

The boards have six layers, alternating copper and epoxy. It was assumed for the analysis that copper covered 25% of the top layer. This takes circuit board components into consideration. This layer is designated by R_1. The other two copper layers were assumed to have 100% coverage and are designated by R_4. The epoxy layers are homogeneous. Figure 7 describes the Node 1 to Node 2 upper board conductances. Appendix 3 shows the node numbers and their relationshps for reference. R_2 describes the conductance of the polyimide (epoxy) layers in each node. To calculate the resistances of R_1 through R_4 Equation 4.6 is used.

$$R = \frac{12\ L_i}{k_i\ w_i\ (th_i)} \qquad 4.6$$

where L is the lenght of the heat flow path, th is the thickness of the contact area, w is the width, and k is the thermal conductivity of the material. Each epoxy layer is 0.01933 inches thick: each copper layer is 0.00134 inches thick. Table 4 lists the resistances calculated by equation 4.6 for the network shown in Figure 7. R_A through R_E are the equivalent resistances as the network is calculated, beginning with resistance R_A and working to resistance R_E. A sample calculation is included for resistance A.

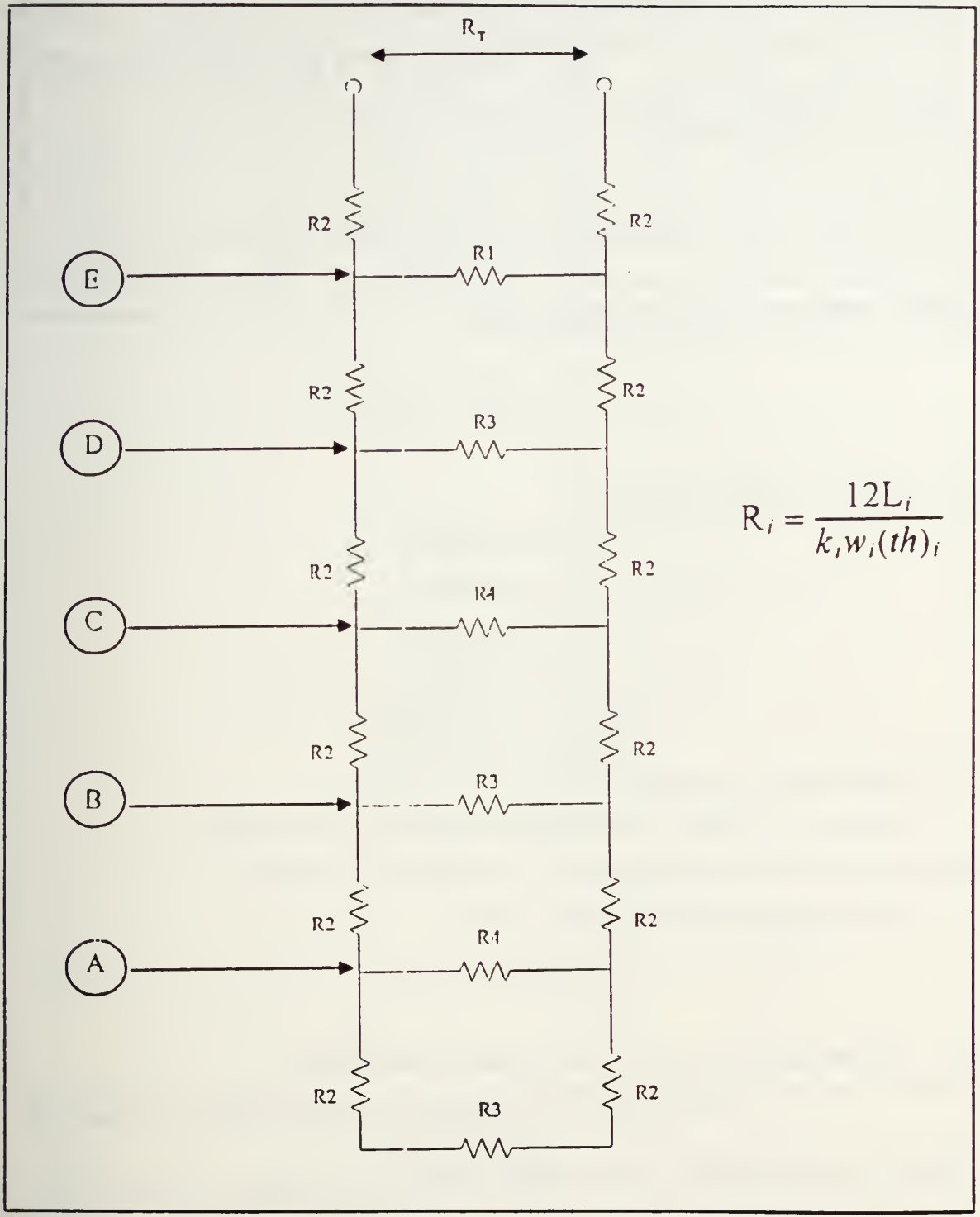


Figure 7. Electrical Power System Node 1 to Node 2

R_i#	L_i	w_i	th_i	k_i	R_i
1	1.00	1.00	0.00134	385 (.25)	93.04129
2	.01933/2	1.00	1.00	0.15	0.77320
3	1.00	1.00	0.01933	0.15	4138.645
4	1.00	1.00	0.00134	385	23.26032

Table 4. Node 1 to Node 2 Resistances

$$R_A = \frac{(R_3 + R_2 + R_2)\ R_4}{R_3 + R_4 + 2\ R_2} \qquad 4.7$$

As a result, for Node 1 to Node 2

$$R_A = 23.13037$$

$$R_B = 24.53051$$

$$R_C = 12.79438$$

$$R_D = 13.79438$$

$$R_E = R_T = 13.16939$$

Using Equation 4.1, K = 0.075934 °F-hr / Btu.

The node 1 to node 9 calculations are based on the same relationships, so that conductance is 0.075934 °F- hr / Btu.

For the radiation from board to board

$$K = 0.1732\ F_A\ F_E\ A \qquad 4.8$$

F_A = 1.00 because the boards are parallel to each other.

$$F_E = \frac{1}{\frac{1}{\epsilon_1} + \frac{1}{\epsilon_2} - 1} \qquad 3.8$$

Because the emissivity of both boards is assumed to be 0.8, $F_E = 0.6667$. After converting the node area into square feet

$$K = 0.1732\ (1.0)\left(\frac{2}{3}\right)\left(\frac{1}{144}\right) = 0.801852 \times 10^{-3} \qquad 4.9$$

Figure 8 describes the contact of the board layers to the housing rails.

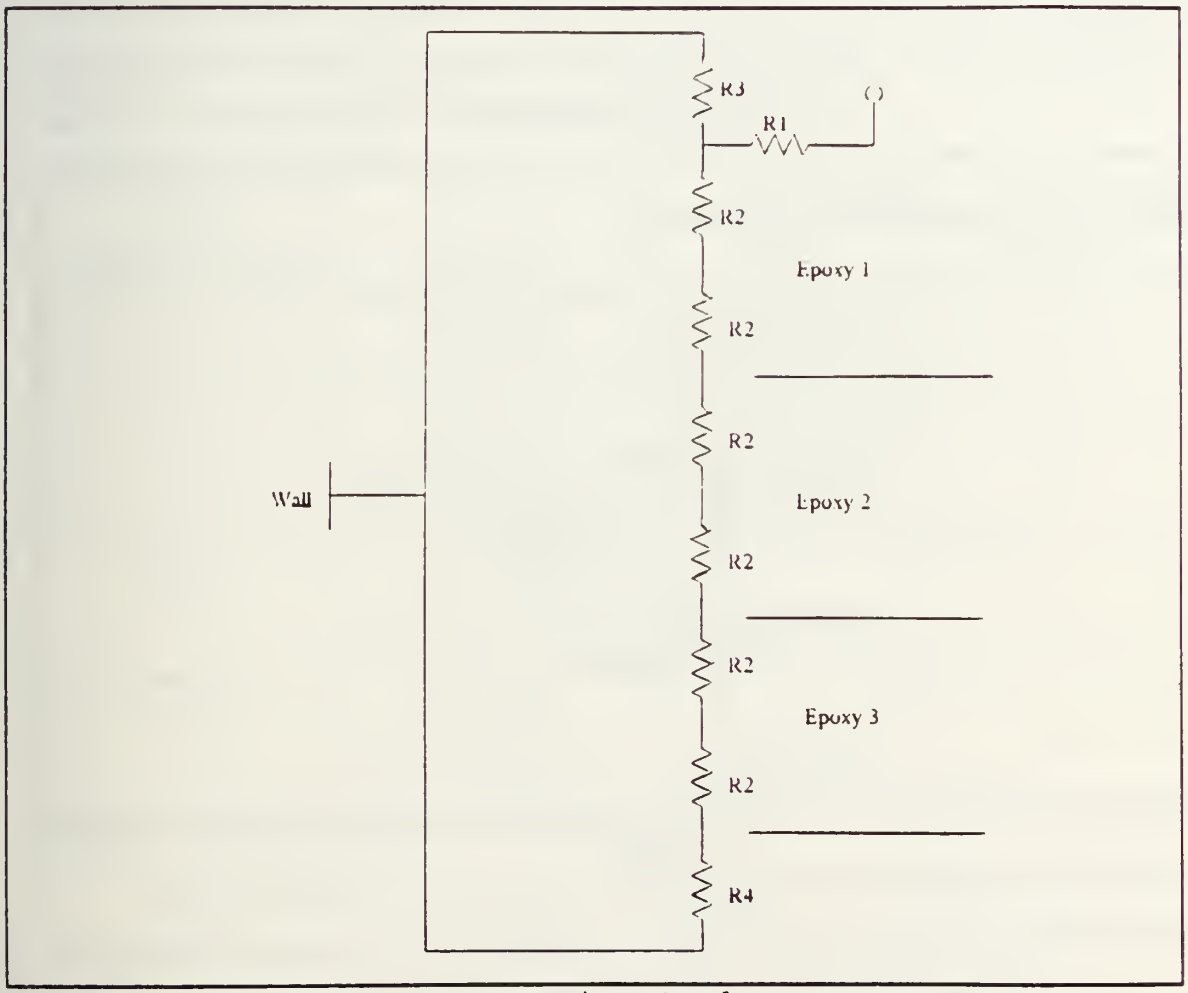


Figure 8. PCB Layers To Housing Conductances

Resistance R_1 is copper and resistance R_2 is epoxy. Resistances R_3 and R_4 are contacts with the railings.

R_1 is half that of the previous R_1 (the path length has been halved).

$$R_2 = \frac{(12)(0.01933/2)}{(1)(0.2)(0.15)} \qquad 4.10$$

$h_c = 500$ for copper contact

$h_c = 400$ for epoxy contact

$$R_4 = \frac{1}{400(0.2)(1/144)} = 1.88 \qquad 4.11$$

$$R_3 = \frac{1}{500\ (0.2)(1/144)} = 1.44 \qquad 4.12$$

Figure 9 is a simplification of Figure 8.

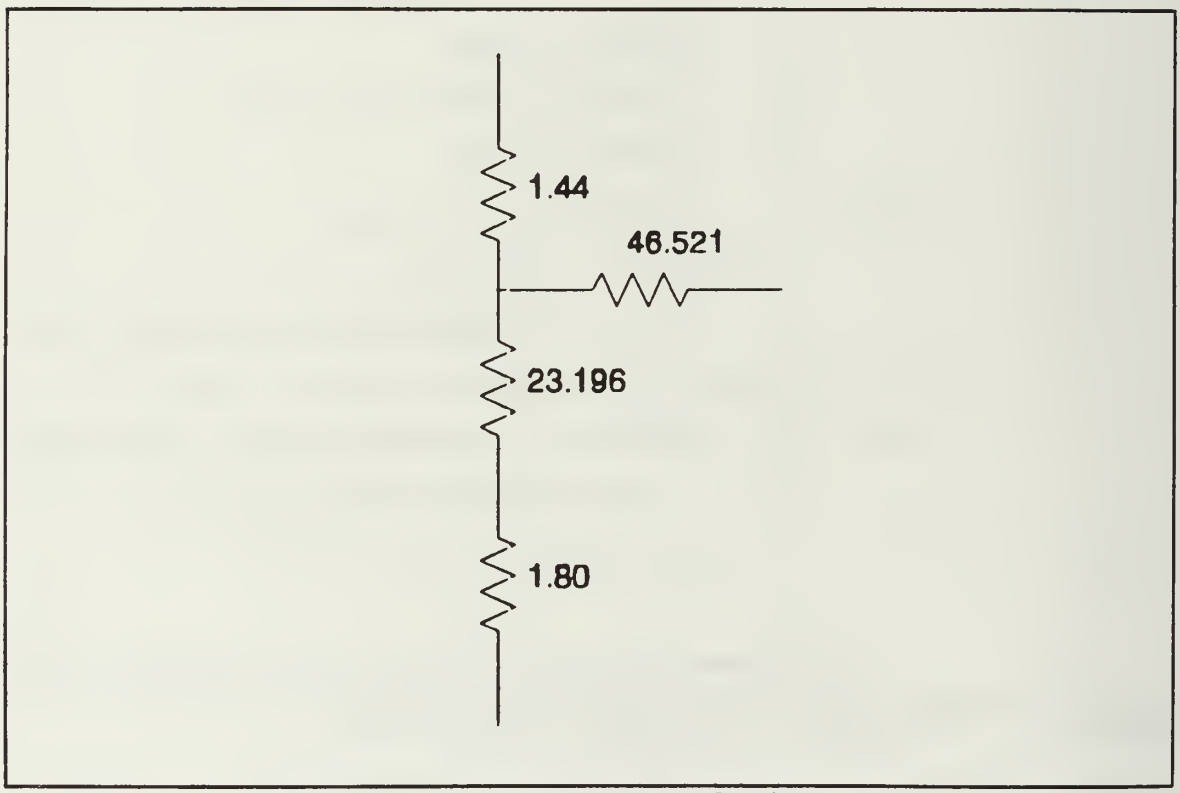


Figure 9. Equivalent Conductance of Figure 8

The equivalent resistance from the network shown in Figure 9 (R_T) = 47.88. K_T is the equivalent conductance, or 0.020885 ° F-hr/ Btu.

Once the conductances were calculated an input file was created, listing the conductances for each node with its associated mode. The input file is shown in Appendix D. The conductance values are listed by node. Beginning at lines 7 and 8 in Appendix D, the node equation describes what node is connected to what, by how much, and by which tag. At line seven, the fixed point integer values are connections and tags. Table 5 describes Node 1 connections contained in line 7.

NODE CONNECTION	POSITION	HOW	TAG
2	TOP PCB	CONDUCTION	1
9	TOP PCB	CONDUCTION	1
73	BOTTOM PCB	RADIATION	3
301	CONSTANT TEMPERATURE	CONDUCTION	1
303	CONSTANT TEMPERATURE	RADIATION	3

Table 5. Node Connections To Node 1

Line 8 contains floating point real numbers which are the appropriate conductance values for the connection. Each node requires an even number of lines. The three constant temperatures defined for the railings and housing were all 33.5 °C. Appendix E lists the heat dissipation by node in watts. The conductances need only be input in one direction as THANSS calculates the reverse connection automatically.

Table 6 lists the results of the steady state analysis of the circuit boards. The highest temperatures appeared on the bottom boards where the heat dissipations were the highest. However, the amount of dissipated heat is relatively low. Temperatures ranged from 34.42 °C to 36.31 °C on the upper board to 34.77 ° to 38.02 °C on the lower board, well within standard operating temperatures for electronic piece parts. A run at 25 °C constant heat source temperatures compared very favorably with an earlier steady state analysis performed using the Integrated Thermal Analysis System (ITAS).

PRINTED CIRCUIT BOARDS - S PATTERSON - RUN A

Temperatures, degC

1	35.38	2	35.78	3	35.96	4	35.92	5	35.80	6	35.67
7	35.48	8	35.19	9	35.62	10	36.14	11	36.31	12	36.12
13	35.88	14	35.72	15	35.54	16	35.34	17	35.56	18	36.00
19	36.15	20	36.10	21	35.91	22	35.71	23	35.48	24	35.18
25	35.65	26	36.16	27	36.24	28	36.25	29	35.95	30	35.64
31	35.36	32	35.00	33	35.48	34	35.91	35	36.05	36	36.05
37	36.07	38	35.56	39	35.24	40	34.90	41	35.55	42	35.96
43	35.80	44	35.69	45	35.58	46	35.32	47	35.10	48	34.86
49	35.36	50	35.60	51	35.65	52	35.42	53	35.27	54	35.08
55	34.87	56	34.63	57	35.01	58	35.34	59	35.28	60	35.17
61	35.06	62	34.91	63	34.72	64	34.49	65	34.80	66	35 03
67	35.08	68	35.04	69	34.95	70	34.81	71	34.64	72	34.42
73	35.53	74	36.12	75	36.49	76	36.67	77	36.91	78	37.19
79	37.02	80	36.25	81	35.66	82	36.56	83	36.93	84	36.90
85	37.20	86	38.02	87	37.99	88	36.51	89	35.63	90	36.28
91	36.75	92	37.10	93	37.32	94	37.94	95	37.80	96	36.43
97	35.63	98	36.23	99	36.82	100	37.78	101	37.44	102	37.35
103	37.06	104	36.08	105	35.46	106	36.01	107	36.63	108	37.69
109	37.25	110	36.91	111	36.50	112	35.74	113	35.43	114	35.90
115	36.26	116	36.54	117	36.55	118	36.43	119	36.15	120	35.46
121	35.11	122	35.60	123	35.75	124	35.91	125	36.05	126	36.03
127	35.83	128	35.23	129	34.85	130	35.18	131	35.38	132	35.53
133	35.68	134	35.70	135	35.55	136	35.02	137	34.71	138	34.99
139	35.19	140	35.32	141	35.41	142	35.38	143	35.21	144	34.86
301	33.50	302	33.50	303	33.50						

Figure 10. PANSAT PCB Temperature by Node

V. TRANSIENT ANALYSIS OF EPS USING ITAS

A. GEOMETRY GENERATION

To begin the analysis of the electrical power system, the geometry of the EPS was reproduced in the computer using the Integrated Thermal Analysis System (ITAS). The geometry was generated by piecing together, rotating and translating shapes from a geometry generation menu. These shapes were then stored in a PARTS file, which were then selectively plotted to allow for surface number and node number displays. The EPS was divided into three distinctly separate entities: the housing and the upper and lower circuit boards. Figure 10 and Figure 11 show the surface numbers and corresponding node numbers for the EPS housing. Each surface generated by ITAS is accessible for thermal node definitions and optical

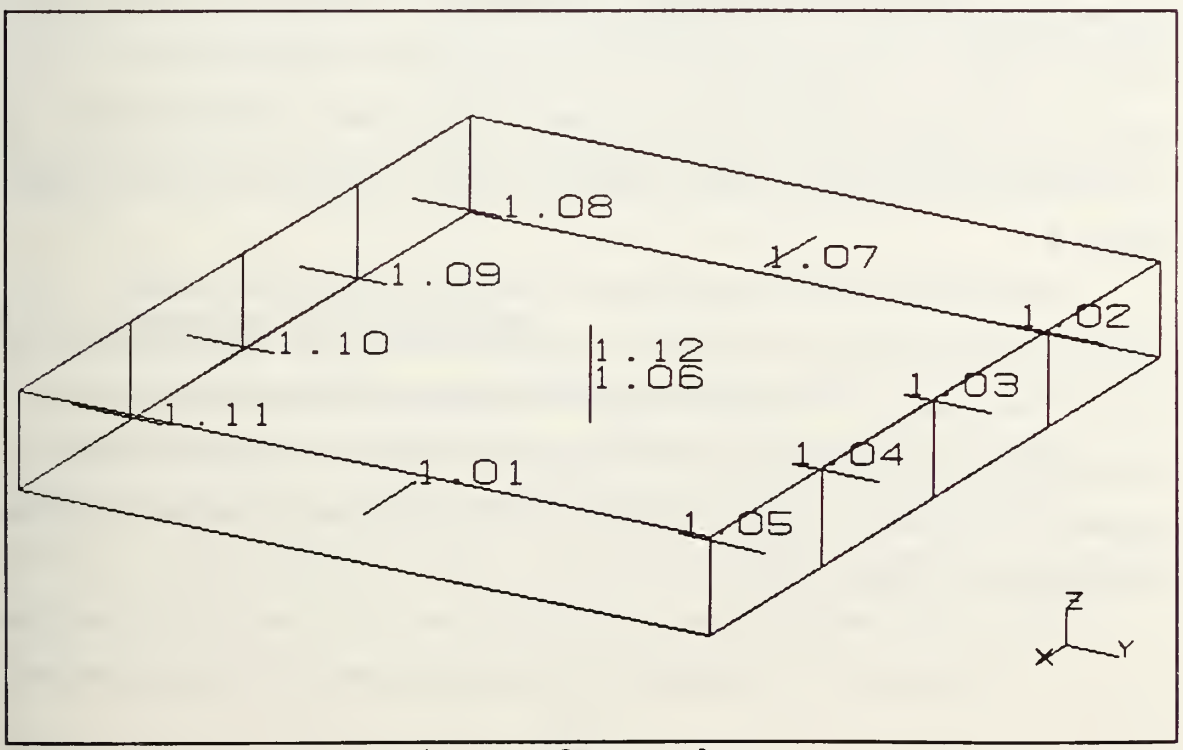


Figure 10. EPS Housing Surface Nodes

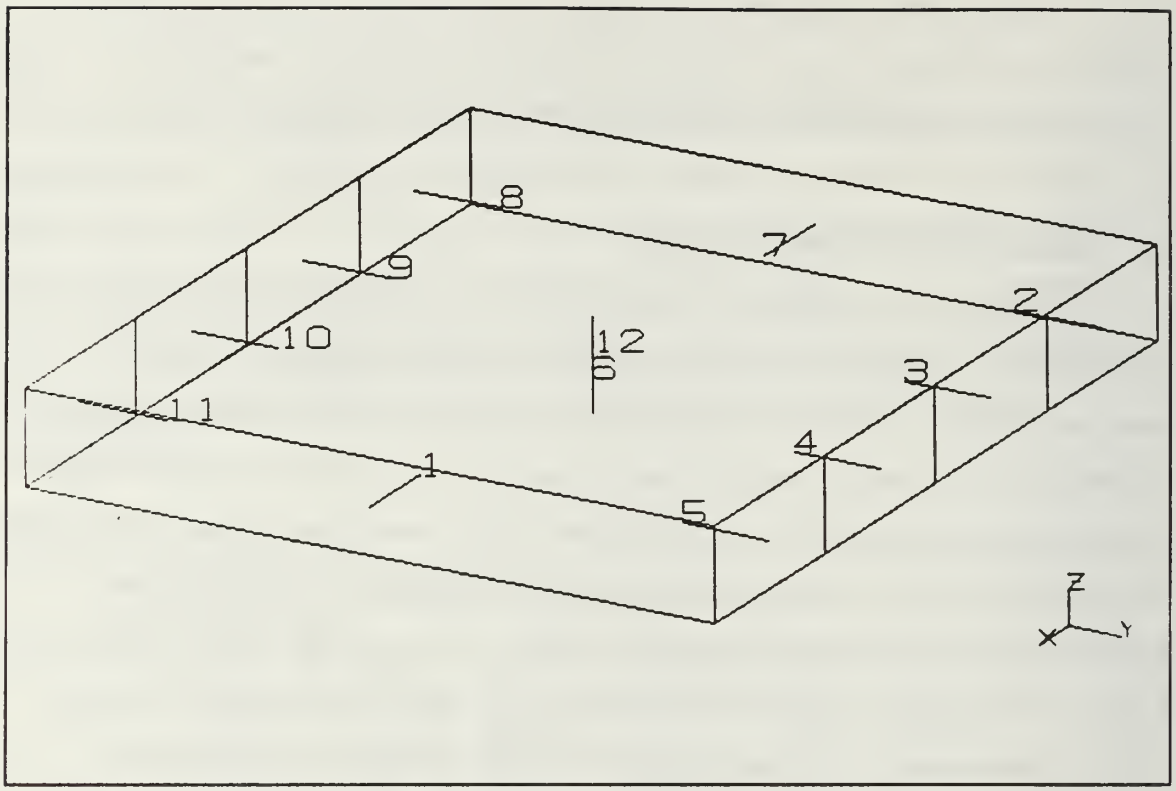


Figure 11. EPS Housing Node Numbers

properties definition. The housing is modelled as a six-sided box having 12 physical nodes. The dimensions of the housing are 9 inches in the X direction, 8 inches in the Y direction, and 1.569 inches in the Z direction. It is mounted underneath the upper equipment plate as seen in Figure 2 and Figure 3.

The upper printed circuit board is modelled as two four sided polygons. The polygons have node numbers from 2.01 to 2.18 and 3.01 to 3.12. This division of the upper equipment panel was done to accurately represent heat dissipations on the board and to define a workable number of conductance values. Appendix F shows both the surface numbers and node numbers for the upper PCB.

The lower PCB was constructed from 5 separate polygons: these node numbers ranged from 4.00 to 8.00. Appendix G shows the surface numbers and corresponding node numbers for the lower PCB. Figure 12 is a view of the integrated thermal nodes of both PCBs and the housing.

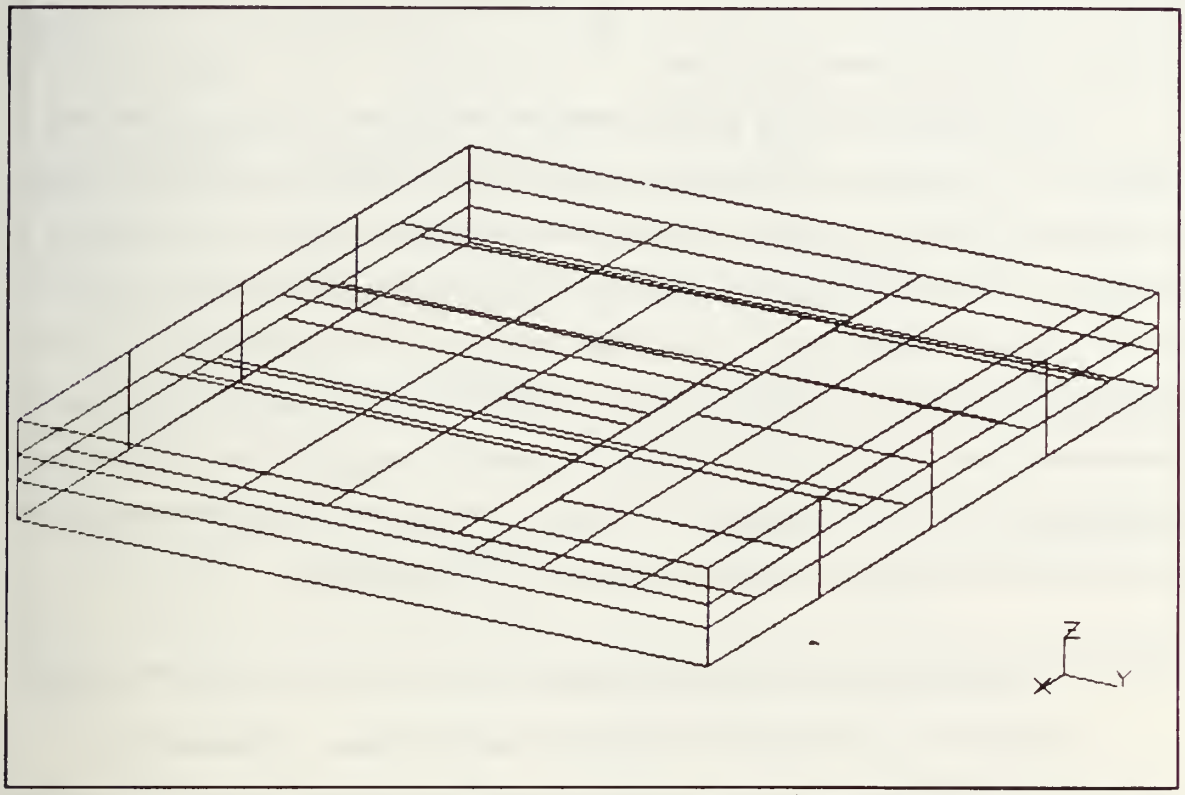


Figure 12. Geometry Model of the Electrical Power System

B. THERMAL PARAMETERS

1. Radiation Conductance Parameters (Script-F)

Script-F factors are the energy quantities incident on each of the surfaces of an enclosure after multiple reflections from the surrounding surfaces. (ITAS User's Manual). The Script Fs are in the IR wavelength and are used during the thermal analysis to account for all thermal radiation interchange, and are calculated from the blackbody view factors in

conjunction with surface optical properties. Since the EPS is an enclosure with no view to space, the program is set to ignore the space node inclusion in the Script F calculations since surfaces inside the enclosures do not "see" surfaces outside the enclosure. [ITAS User's Manual, 1992]

2. Optical Properties Data

The optical properties data defines the properties of all surfaces and combines the geometric surfaces that have been created into thermal nodes. The optical properties listed in the Material Properties Library of ITAS were used for the housing (Aluminum 6061-T6) and for the copper layers of the printed circuit boards. These properties include the solar absorptivity (alpha) and infrared emissivity (epsilon) values. Individual capacitances and thermal dissipations were not defined in these screens but were defined in the User Node section. The surfaces that are listed in the Optical Properties entries in Appendix H are the geometric surfaces that ITAS generates.

3. Non-Geometric Node Definitions

In addition to the Optical Property node generation, additional non-geometric nodes were created. These nodes do not have a physical presence in ITAS. Examples of these nodes included the rails in the EPS housing to which the circuit boards are secured; the PCB board layers, which alternate copper and polyimide; the upper equipment plate, to which the top of the EPS is mounted; and the component pin nodes. Table 6 indicates the non-geometric node assignments. These nodes are also known as diffusion nodes: diffusion nodes, although not part of the ITAS geometry file still have finite mass. Nodes are not numbered consecutively to allow for flexibility and also to allow easy identification. For example, all nodes that are numbered 9XX are either housing or railing nodes: all of these nodes are

made of aluminum. Nodes 16XX and 6XX, 14XX and 4XX, 12XX and 2XX are all copper layers of the printed circuit boards.

Node Number	Identification	Node Number	Identification
901-912	EPS housing	913	Equipment Plate
921-926	EPS rails	201-230	Top PCB top Cu
401-430	Top PCB mid Cu	501-530	Top PCB bot Cu
1201-1217	Bot PCB top Cu	1401-1417	Bot PCB mid Cu
1601-1617	Bot PCB bot Cu	101-130	Top PCB T poly
301-330	Top PCB M poly	501-530	Top PCB B poly
1101-1117	Bot PCB T poly	1301-1317	Bot PCB M poly
1501-1517	Bot PCB B poly	2XXX	Pins-Top PCB
3XXX	Pins- Bot PCB		

Table 6. Non-Geometric Node Numbers

The thermal capacitance of the diffusion nodes is entered in this screen. Thermal mass is also another name for thermal capacitance.

$$Thermal\ Mass = C = c\ \rho\ V \qquad 5.1$$

where c is specific heat in cal/g °C,

ρ = density of the material in kg/m^3,

V = volume of the material in m^3.

ITAS requires C to be in W-min / °C. To convert to the correct units the following conversion factor is used.

$$C = \left(\frac{cal}{g\,^{\circ}C}\right)\left(\frac{kg}{m^3}\right)(m^3) = \frac{cal}{(.001)^{\circ}C} \qquad 5.2$$

$$1\ cal = 1.163 \times 10^{-6}\ kw\text{-}hr = 1163 \times 10^{-6}\ W\text{-}hr \qquad 5.3$$

$$1163 \times 10^{-6}\ W\text{-}hr = 6.978 \times 10^{-2}\ W\text{-min} \qquad 5.4$$

$$\frac{6.978 \times 10^{-2}\ W\text{-min}}{(0.001)\ ^{\circ}C} = 69.78\ W\text{-min}/^{\circ}C \qquad 5.5$$

This is the conversion factor used in Appendix I to calculate the thermal masses of all physical nodes. The following values were used in the calculations. [Penton Publishers, 1986]

EPS Housing Thickness	0.2 in
Equipment Plate Thickness	0.125 in
PCB Board Copper Layer	0.000134 in
PCB Board Poly Layer	0.001933
Density of Aluminum	2728 kg/m^3
Density of Polyimide	1950 kg/m^3
Density of Pin Material	8378 kg/m^3
Density of Copper	8666 kg/m^3
Specific Heat of Al	0.199 cal/kg °C
Specific Heat of Cu	0.098 cal/kg °C
Specific heat of Ni-Steel	0.11 cal/kg ° C
Specific Heat of Polyimide	0.31 cal/kg °C

Since ITAS allows total capacitance of each surface of the nodes to be entered into the model if the remaining surfaces are zeroed out. For pin

conductances, the total thermal mass of the pins in each major node were considered as one node. For example, Node 2011 is the total capacitance of all pins through the top layer of geometric node 3.01.

Heat dissipations were also entered in this screen. These dissipations were obtained from the PANSAT design team. The component list and PCB board layouts are included as Appendix J. The top board design is currently much more mature than the lower board design and estimated heat dissipations were more accurate. Appendix K is the Node Data Entry for Thermal Analysis for the EPS.

4. Conductance Definitions

All conductances entered into the EPS model were defined as linear (two way); this type of conductance also applies to the nodes defined by ITAS. All conductance values were precalculated and entered into the model: unlike THANSS, radiation modes are calculated by ITAS. Equation 3.3 was used to calculated all conductances not involving contact conductances.

$$K = \frac{k\,A}{L} \qquad 3.3$$

Conductances not involving contact conductances included EPS housing to housing nodes; EPS housing to railing nodes (since the rails will be part of the housing); copper board nodes to copper board nodes and polyimide to polyimide nodes: and pin segment nodes to pin segments. Pins were modeled as one equivalent pin through each geometric node; however, each pin was divided into six nodes since they traverse through the board layers.

5. Contact Conductances

Contact conductance is defined in Equation 5.6.

$$h_c = \frac{(1.25)\,(k_s)\,(\frac{P}{H})^{.95}}{S_r} \qquad 5.6$$

$$k_s = \frac{2\,k_1\,k_2}{k_1 + k_2} \qquad 5.7$$

where P = contact pressure of the surfaces, chosen as 15 psi for all contact.

H = hardness of the material. Brinell hardness numbers were used.

S_r = surface roughness

To calculate total conductance, first the conductance of the first material is calculated using Equation 3.3, resulting in K_1. Then the conductance of the second material is calculated, resulting in K_2. The total conductance (K_T) is calculated by Equation 5.8, with the results in W /° C.

$$K_T = \frac{1}{\frac{1}{K_1} + \frac{1}{h_c} + \frac{1}{K_2}} \qquad 5.8$$

The ITAS node-to-node conductance calculations are shown in Appendix L, with the conductance data entry in Appendix M.

6. Temperature Profile

ITAS uses temperature profiles for time varying boundary nodes. Boundary nodes without time variation must be input into the user-node definition section. A temperature profile (Figure 13) of the upper equipment

plate obtained from the THANSS/TASS transient analysis of the spacecraft structure used in the EPS analysis. The initial temperature was an estimate of Kennedy Space Center temperatures in October.

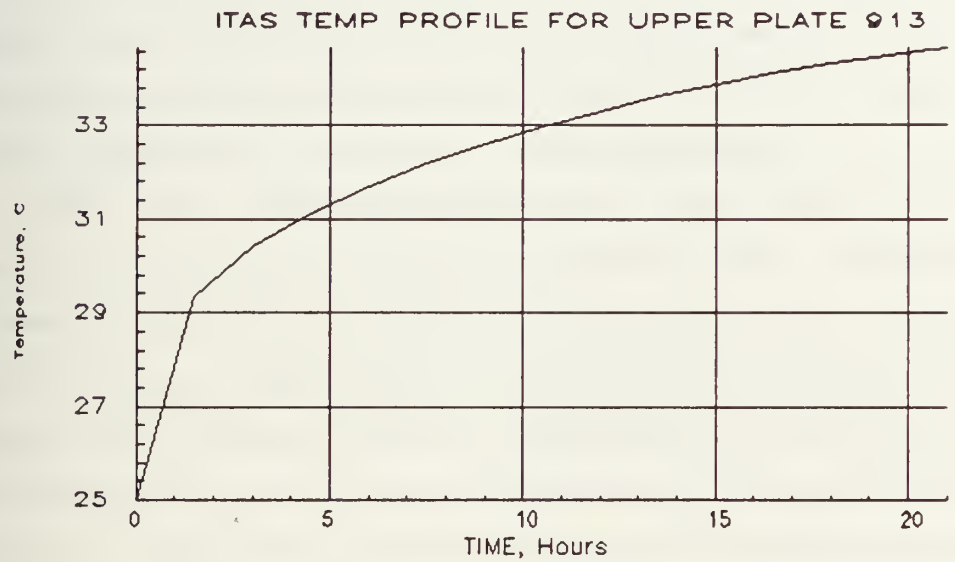


Figure 13. ITAS Temperature Profile For Equipment Plate

VI. THERMAL ANALYSIS OF BATTERIES

A. NICKEL-CADMIUM BATTERIES

Batteries can either be primary or secondary; secondary batteries can be recharged and reused. Batteries are made of cells that can be linked together in series or parallel. Cells linked in series have the positive terminal linked to the next cell's negative terminal: in a parallel connection positive terminals are linked to positive terminals and negative to negative. PANSAT's two batteries have 10 cells each linked in series. In series connections the voltage of the connected cells add while the capacity (normally measured in ampere hours) remains constant.

Sealed nickel cadmium cells operate as a closed system that recycle gases created within the cell, so that no electrolye is lost. Sealed cells with a resealable vent for safety are still considered sealed cells. Nickel-cadmium cells (Ni-Cd) have a higher energy to volume ratio than most other secondary batteries, have a relatively high rate of discharge, and can recharge quickly. Ni-Cd batteries are known for their long storage and operating life, can operate over a wide range of temperatures and environments maintenance free. Additionally, Ni-Cd batteries can handle continuous overcharge so the battery can be maintained in a ready state until needed. [Gates Energy Products, 1992]

Temperature is a very important condition for Ni-Cd batteries. The effective internal resistance of these cells is at a minimum when cell temperature is between 20 °C and 40 °C. Figure 14 shows the relationship between cell disharge temperature and the effective internal resistance. Temperature also effects a cell's effective no-load voltage. For an Ni-Cd

cell, the effective no-load voltage is near the peak at room temperature: the decline is more pronounced at cooler temperatures. Figure 15 shows the

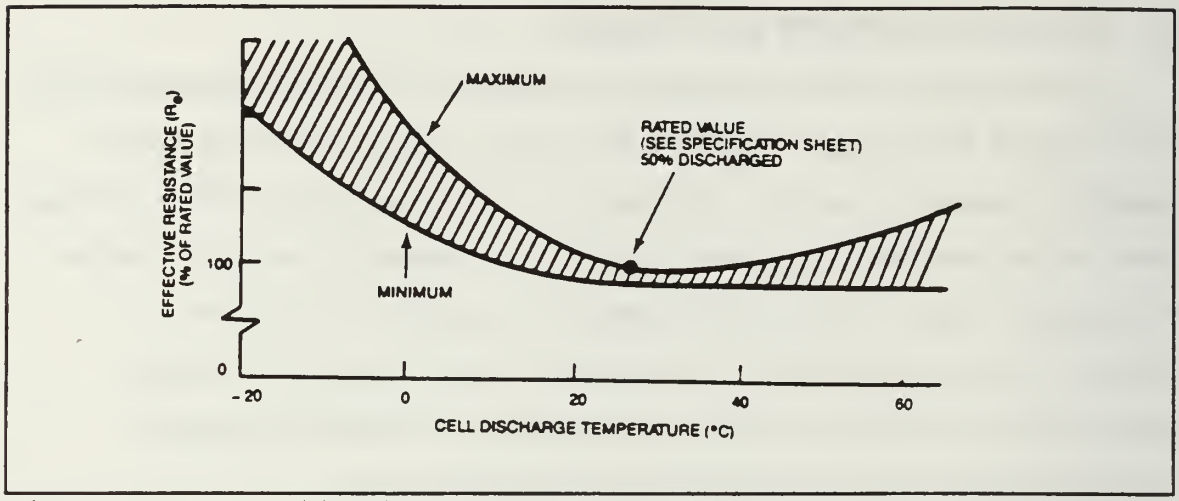


Figure 14. Cell Discharge Temp vs Internal Resistance "From Ref. [Gates, 1992]".

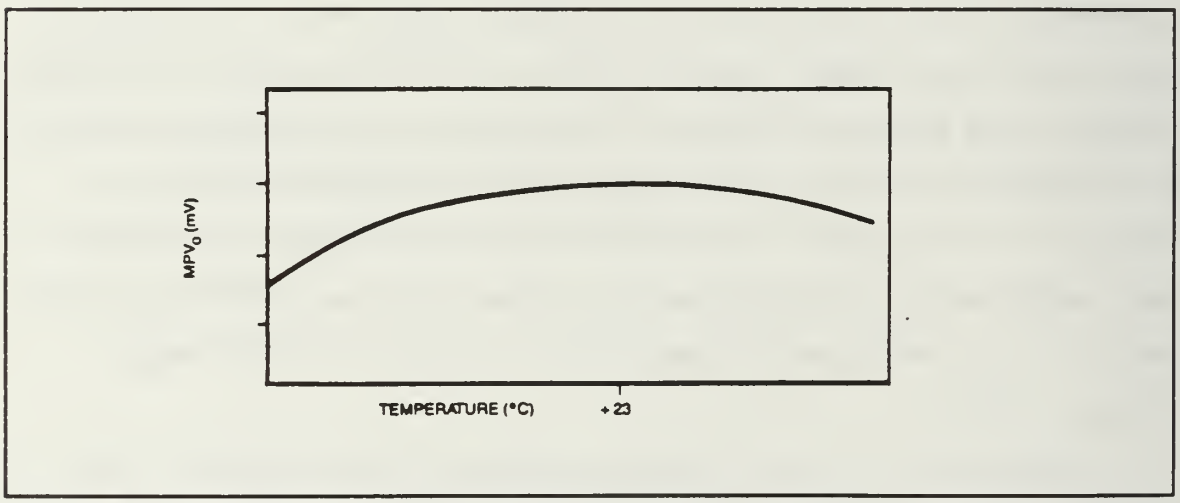


Figure 15. Cell Discharge Temperature vs No-Load Voltage "From Ref. [Gates, 1992]".

relationship between cell discharge temperature and no-load voltage.

An increase in cell temperature also has a negative effect on cell capacity. At elevated temperatures more charge is required for the cell to

become fully charged, and the higher temperatures also decrease the cell capacity to below standard. Cell capacity while charging is not normally affected by temperatures below 23 °C, however, lower temperatures (below 23 °C) have a negative effect on cell capacity during discharge. Room temperature is the ideal environment for PANSAT's batteries. Space rated Ni-Cd batteries would be the technical choice for PANSAT; however, the cost of space rated batteries (approximately $200,000) is prohibitive.

PANSAT batteries are redundant: only one battery will operate at a time. However, the batteries must recharge to full capacity between each use for optimum performance. The current power budget is being examined to determine how long each battery will take to recharge after each use. A typical Ni-Cd battery will require about 160% of energy stored to recharge.

B. BATTERY GEOMETRY MODEL

To model the PANSAT battery, it was necessary to include the Digital Control Subsystem and the Electrical Power Subsystem in the model due to the proximity in the spacecraft. The model was built using ITAS. The two batteries and the DCS were the mounted on the lower equipment plate, built by connecting seven polygons. The spacecraft structure was built around the lower equipment plate, and the upper equipment plate, with the Electrical Power Subsystem (EPS) attached was added. The build progression is demonstrated in Appendix N. The geometric battery thermal model is shown in Figure 16.

After building the geometry model each surface was assigned a surface number and a node number. An example of this assignment is shown in Appendix O. The surface number and node number are related in the property data information of the model, shown in Appendix P. This is where the absorptivities and emissivities of the structure and box housings

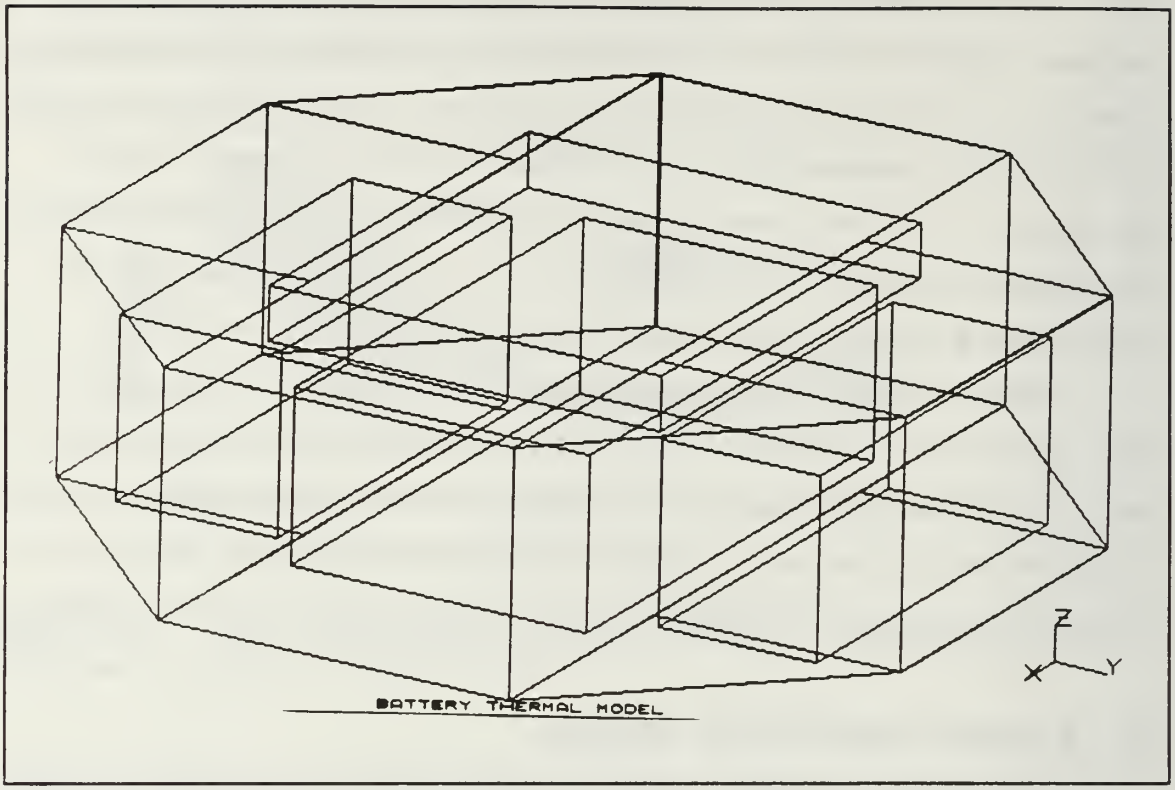


Figure 16. Battery Thermal Model

are listed. Since the box housing designs are not finalized, Aluminum- 6061-T6 was chosen. This material has an absorptivity of 0.4 and an emissivity of 0.79. Additionally, every surface on the boxes is given its own surface number and node number.

C. BOUNDARY CONDITIONS

Since a large percent of the model required the incorporation of PANSAT's structure, boundary nodes were used to define temperatures on areas that had already been analyzed. Surfaces that were defined as boundary nodes have temperatures which remain constant. The results from the transient analysis of PANSAT's structure were used. The structure was divided into areas as seen in Figure 17. Each square area is divided into nine

equal nodes: the triangular areas are divided into six unequal nodes. The sections affecting the battery model are sections one through eight.

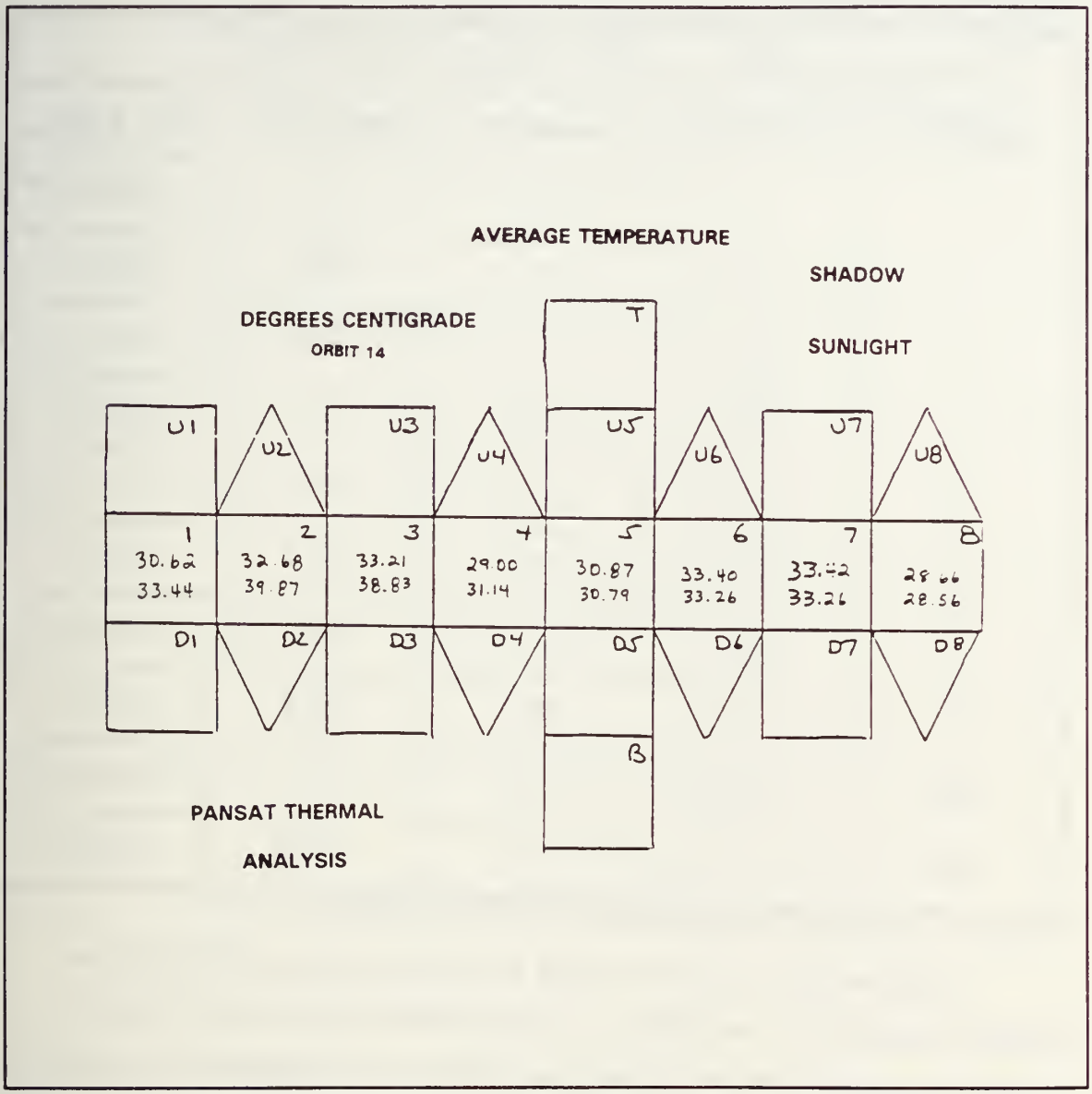


Figure 17. PANSAT Structural Divisions

Appendix Q lists the transient temperatures with internal heat dissipation by node for the shadow and sunlit zones for orbit 14. This was chosen since the spacecraft temperatures are leveling out: however, worst case

temperatures were not extrapolated. Table 7 relates the structural number of Figure 17 to the node numbers of Appendix Q, and then lists the average temperature for that area for both shadow and sunlight.

	NODE	AVG. TEMP	AVG. TEMP	
SECTION	NUMBERS	SHADOW	SUNLIGHT	S/C AREA
1	1-9	30.6	33.4	WALL
2	10-18	32.7	39.9	WALL
3	19-27	33.2	38.8	WALL
4	28-36	28.7	31.1	WALL
5	37-45	30.8	39.9	WALL
6	46-54	33.4	33.3	WALL
7	55-63	33.4	33.3	WALL
8	64-72	28.7	28.6	WALL
N/A	219-226	32.9	33.7	LOWER PL
N/A	211-218	32.1	32.9	UPPER PL

Table 7. Average Temperatures in Celcius for Pass 14

These temperatures were used as boundary nodes, indicated as negative numbers in Appendix R. This appendix also lists the thermal masses (capacitances) for all hardware nodes. The explanation for thermal mass calculation is contained in Chapter V; the thermal mass calculations are included as Appendix S. Heat inputs to each box were estimated and defined in Appendix R as a node with no mass. This heat input was attached to the six walls of the housing where that heat input resides, and

the heat was conducted outward through the walls. EPS boundary conditions were derived from the transient analysis.

Conductance values were calculated as in Chapter V and included in the ITAS Conductor Data Entry. Only surfaces within the boxes themselves or conductances between the heat nodes and the boxes are included since the upper plate, lower plate, and sidewalls are defined to have constant temperatures.

VII. RESULTS AND RECOMMENDATIONS

A. ELECTRICAL POWER SYSTEM

The analysis of the EPS transient analysis can be divided into three areas; the housing nodes, the upper board nodes, and the lower board nodes.

1. EPS Housing Nodes

Figures 18 and 19 show the temperature versus time plots for the EPS housing sidewalls and the top and bottom of the housing. As it would be be expected for a node which touches the outside edges of the housing, the

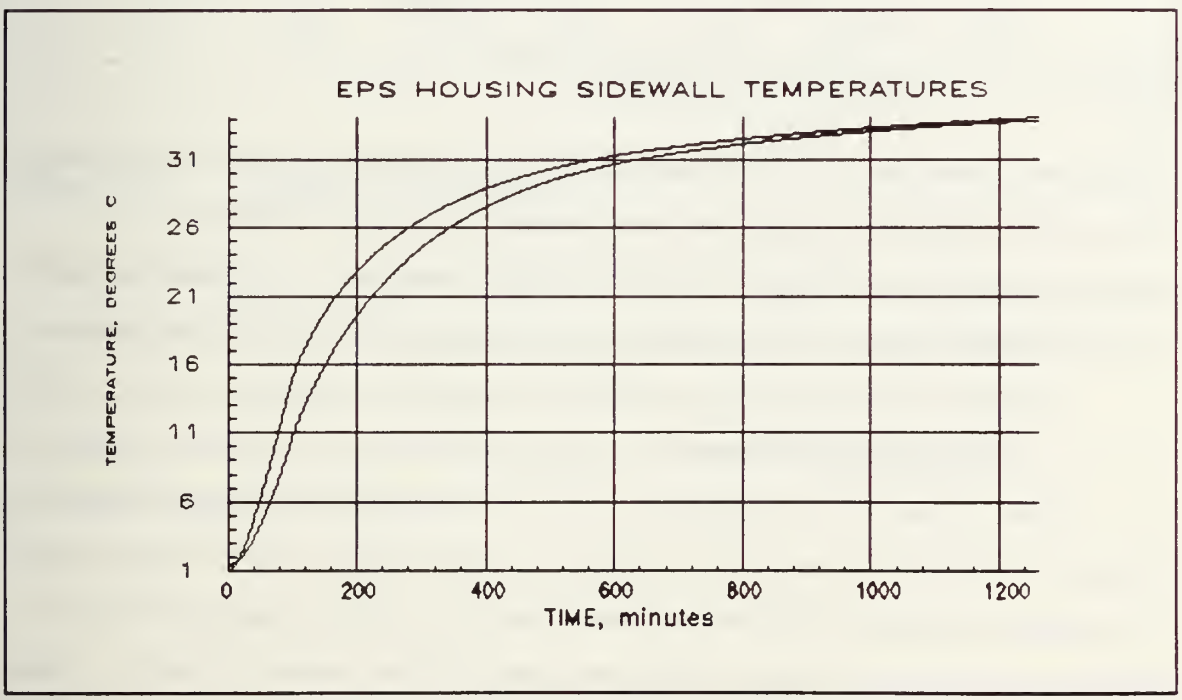


Figure 18. EPS Housing Temperature Trends

temperatures start low and become warmer. The bottom plate in the EPS housing would tend to be warmer than the top because the bottom has

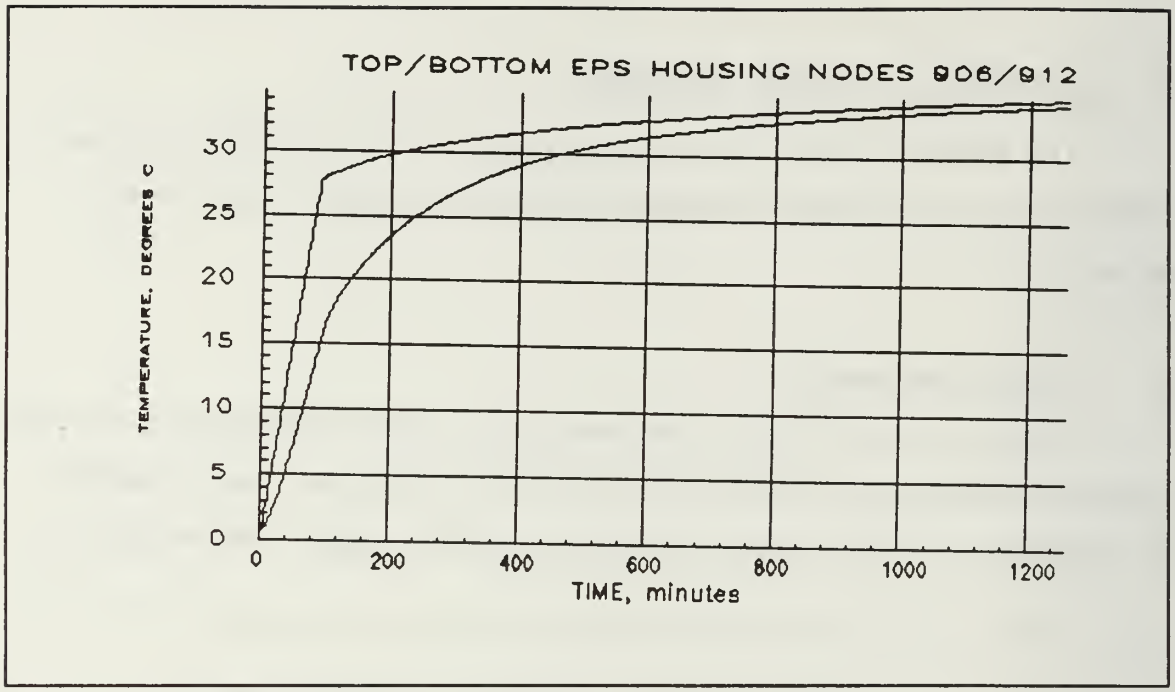


Figure 19. EPS Housing Trends

more heat dissipation. One drawback to the present analysis is that there was only enough information for a temperature profile of the lower equipment plate for 14 orbits. This, in effect, results in a transient analysis for that period of time and a steady state analysis for the following time.

2. Printed Circuit Boards

From Figure 20 it is apparent that any node that is attached to the housing sidewalls is going to experience a trend similar to the housing itself. In the case of the top PCB, nodes which butt up to the housing start cold and see a decreasing slope, starting to level off after about 17 hours. Nodes that do not touch the sidewalls (midboard in this case) remain between 20°C to 25 °C for the duration. This board remains cooler than the bottom PCB because the heat dissipations in the upper board are relatively low.

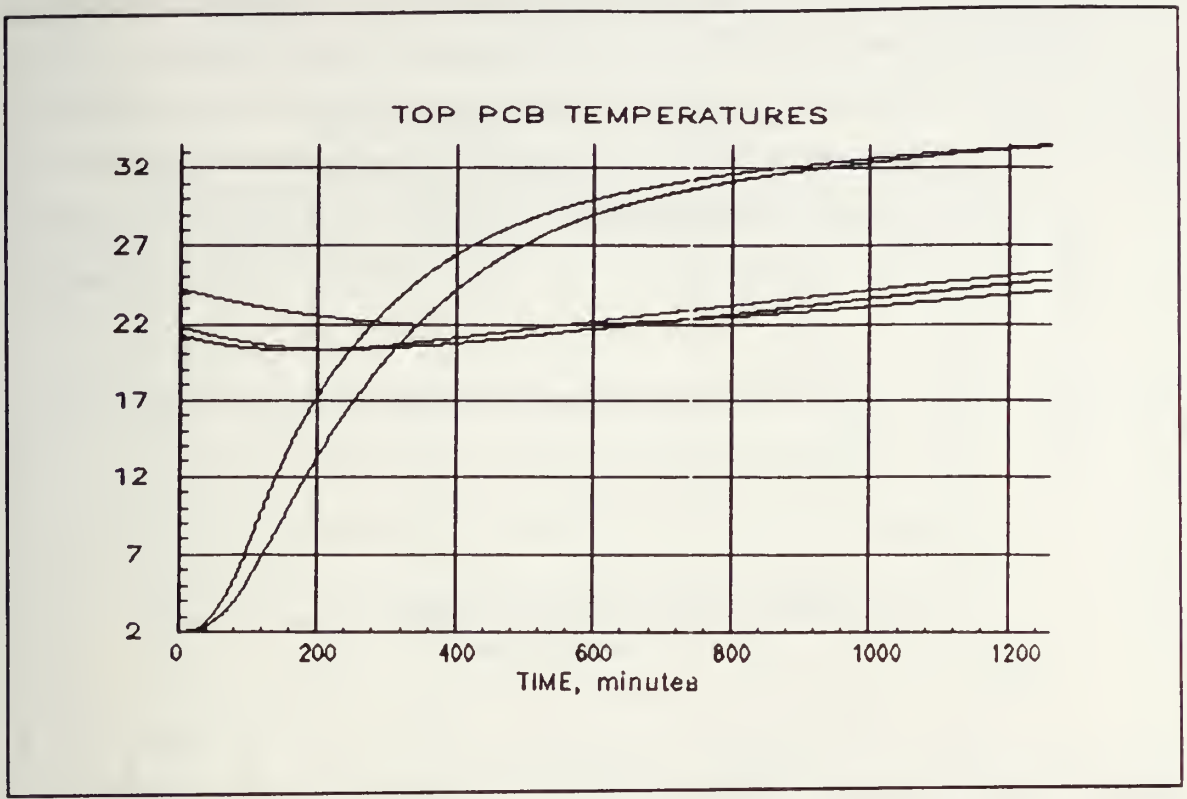


Figure 20. Upper PCB Results

The bottom PCB, as shown in Figure 21, has a similar curve for those nodes which attach to the rails, with the resulting final temperature very similar to the upper PCB. However, midboard nodes are approximately 4-5 degrees warmer on the bottom board, where the highest heat dissipations are concentrated.

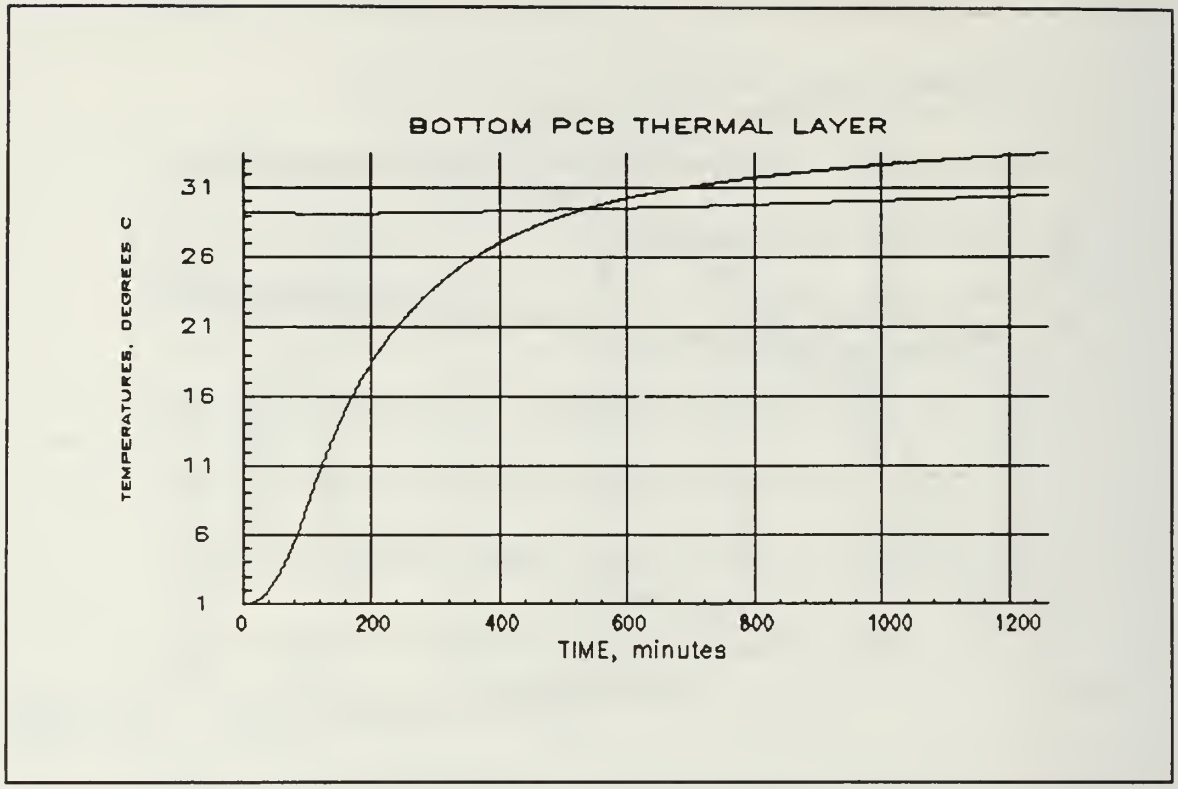


Figure 21. Bottom PCB Trends

B. BATTERIES

A steady state analysis was performed first on the battery. A copy of the results of both the steady state and the transient analysis is included as Appendix V. The transient analysis shows Battery A, Battery B, and the DCS at 33.7 ° C.

ITAS would not allow the model to be run as an enclosure. An ideal case would have been to run the battery first as an enclosure similar to the procedure used for the EPS. Since the cell information was not available, this run was performed to give a general battery environmental range. The analysis was effectively a steady state analysis since most of the structure had boundary nodes attached. This temperature is within the advertised

advertised operating ranges for a battery but is some distance from the ideal 23 °C. A second analysis was performed simulating a layer of Multilayer Insulation (MLI) on the bottom of both batteries. The result of this analysis can be seen from Figure 22. Although the initial temperatures are lower, the boxes quickly heat up. A third run insulating all six sides reduced the temperature by 3 °C to 30.7 °C.

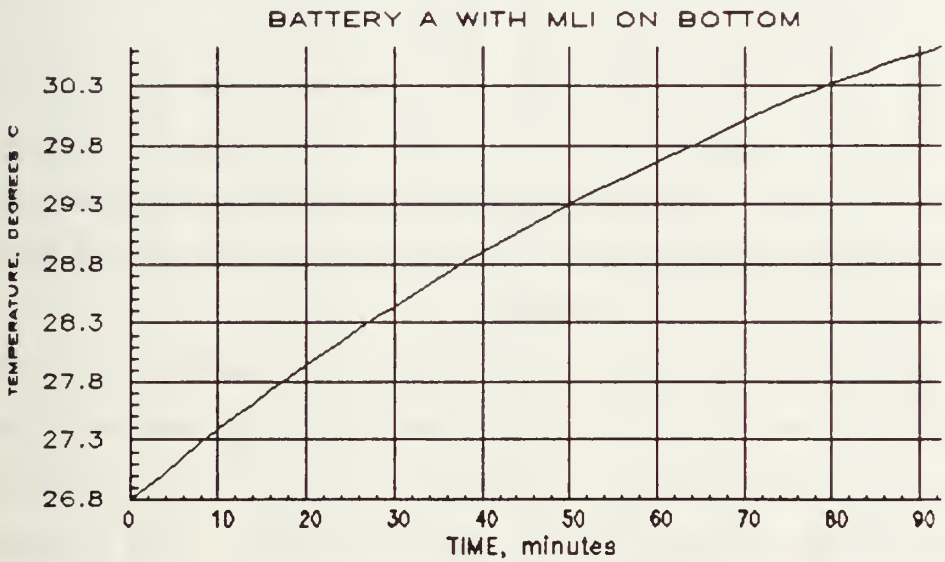


Figure 22. Temperature vs Time for Battery with MLI

C. RECOMMENDATIONS

To make the thermal analysis more realistic for the Electrical Power System, duty cycles for the printed circuit boards need to be established. This would give a more accurate time versus temperature plot. For the batteries, cell selection would allow the modelling of the cells inside the batteries as demonstrated in Appendix W. Dissipations for the high power use boxes would contribute to the accuracy of the model. As the individual boxes are created by ITAS, the spacecraft subsystems can be combined into a viable and accurate spacecraft model.

This analysis is only as accurate as the boundary conditions. This model should be rerun when boundary conditions obtained from the transient analysis of PANSAT structure using ITAS are completed.

ITAS was created to model spinning and stationary spacecraft. When PANSAT design is mature enough to run the entire model, there is an option in the Parameter Set Up and Alteration Menu for user defined spacecraft attitudes, where the satellite can be rotated in time on the X-Y-Z axes to more accurately represent a tumbling body.

ITAS can accurately represent the orbit of the satellite, and allows two methods. The first method requires the definition of the inclination, sun Right Ascension and Declination, and the Longitude of the Ascending Node. The other method requires definition of the beta angles. Both methods define perigee and apogee, so that time spent in sunlight and time spent in shadow are considered in the satellite's environment. The most likely orbit, looking ahead with shuttle mission manifests, suggests planning for a 51.6° inclination and a 213 NM circular orbit.

APPENDIX A. PANSAT STEADY STATE TEMPS IN SUNLIGHT

PANSAT - STEADY STATE - SUNLIGHT ZONE - WITH INTERNAL HEAT DISSIPATION

Temperatures, degC

1	54.98	2	57.32	3	59.02	4	53.88	5	56.55	6	58.84
7	53.63	8	55.55	9	57.55	10	64.39	11	65.71	12	65.90
13	64.44	14	66.16	15	66.49	16	61.06	17	62.18	18	62.52
19	64.12	20	63.05	21	61.13	22	65.46	23	64.24	24	61.74
25	62.28	26	61.51	27	59.63	28	55.48	29	53.59	30	52.79
31	54.99	32	52.71	33	51.62	34	53.55	35	52.01	36	51.35
37	51.82	38	51.59	39	51.60	40	50.76	41	50.59	42	50.82
43	51.37	44	51.37	45	51.53	46	51.62	47	51.80	48	52.02
49	52.04	50	52.41	51	52.65	52	52.10	53	52.33	54	52.55
55	52.52	56	52.34	57	51.47	58	52.86	59	52.60	60	51.47
61	53.11	62	52.98	63	52.18	64	48.10	65	47.91	66	49.27
67	47.95	68	47.46	69	48.96	70	48.85	71	48.42	72	49.51
73	49.42	74	52.32	75	58.48	76	51.94	77	56.38	78	59.60
79	53.83	80	57.12	81	59.59	82	64.99	83	64.86	84	63.83
85	65.70	86	65.11	87	66.18	88	62.35	89	59.82	90	57.10
91	64.39	92	62.35	93	59.92	94	63.36	95	61.71	96	59.46
97	52.58	98	51.86	99	52.36	100	51.26	101	53.86	102	52.37
103	48.07	104	44.92	105	44.12	106	48.10	107	46.00	108	45.74
109	50.27	110	49.21	111	48.95	112	45.59	113	45.67	114	47.48
115	47.75	116	49.05	117	49.52	118	44.90	119	44.92	120	45.32
121	46.75	122	46.39	123	46.29	124	49.21	125	48.94	126	48.41
127	45.90	128	46.22	129	44.97	130	45.43	131	46.38	132	47.89
133	49.96	134	51.51	135	53.56	136	47.60	137	49.41	138	53.08
139	46.96	140	48.34	141	53.13	142	57.85	143	58.21	144	58.69
145	58.77	146	62.04	147	62.32	148	57.53	149	56.13	150	54.21
151	57.53	152	54.98	153	52.82	154	56.64	155	53.07	156	51.50
157	50.39	158	49.35	159	49.92	160	49.00	161	50.82	162	50.60
163	50.26	164	50.41	165	50.65	166	48.66	167	48.35	168	49.35
169	48.97	170	47.28	171	49.22	172	50.37	173	50.63	174	50.98
175	51.27	176	54.24	177	54.37	178	51.72	179	51.14	180	50.49
181	50.83	182	49.86	183	48.86	184	50.46	185	48.74	186	48.11
187	47.21	188	47.06	189	47.15	190	46.91	191	48.63	192	48.54
193	44.30	194	46.16	195	50.51	196	44.97	197	47.58	198	52.66
199	46.52	200	49.44	201	54.75	202	47.11	203	46.56	204	47.86
205	46.43	206	45.95	207	48.40	208	45.99	209	46.81	210	50.18
211	58.00	212	58.41	213	58.30	214	56.97	215	54.40	216	53.37
217	52.53	218	52.18	219	54.88	220	56.02	221	56.09	222	54.86
223	53.86	224	53.78	225	53.69	226	54.02	227	53.85	228	53.26
229	51.16	230	50.79	231	48.47	232	47.90				
301	-272.80										

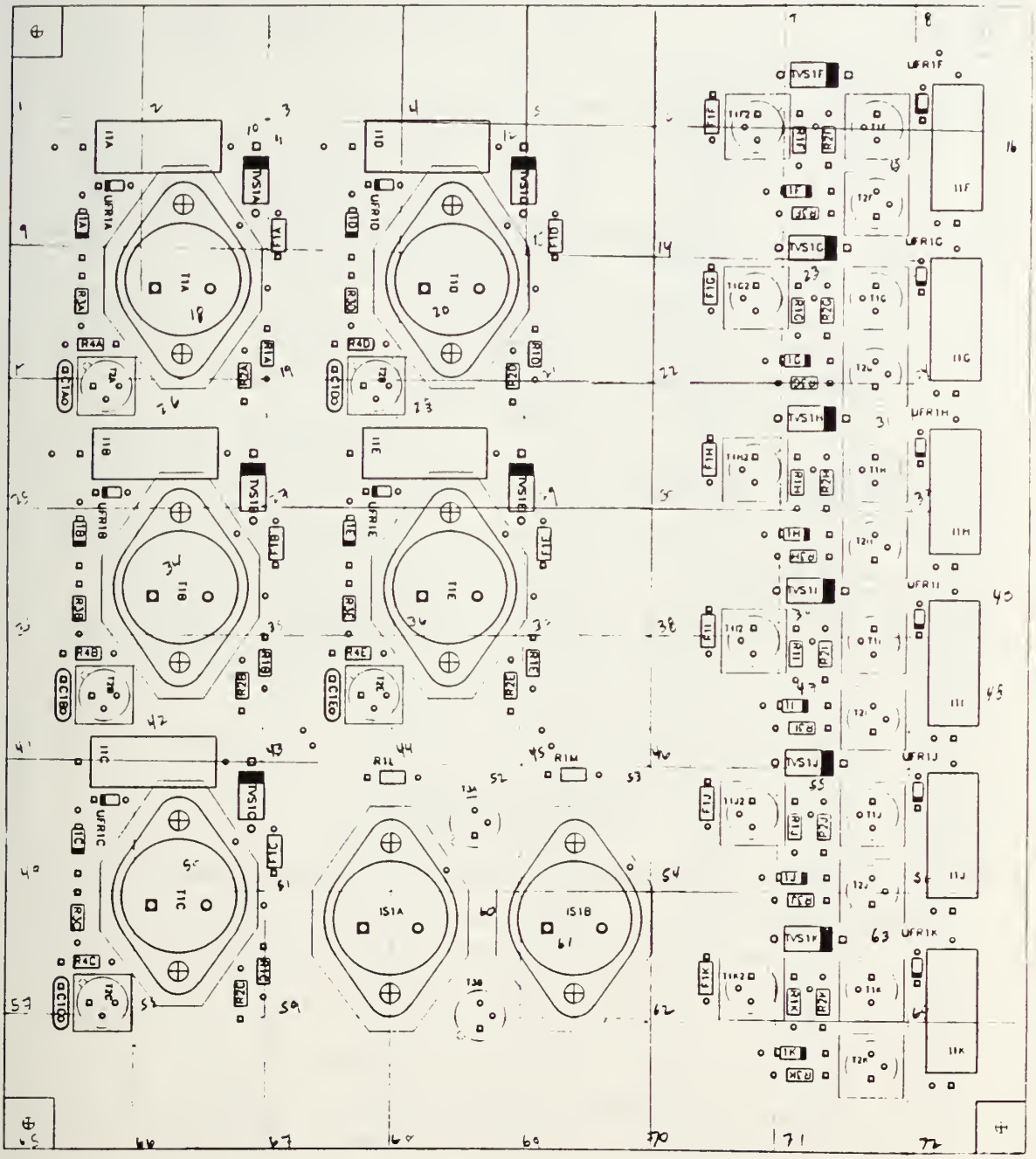
APPENDIX B. PANSAT STEADY STATE TEMPS IN SHADOW

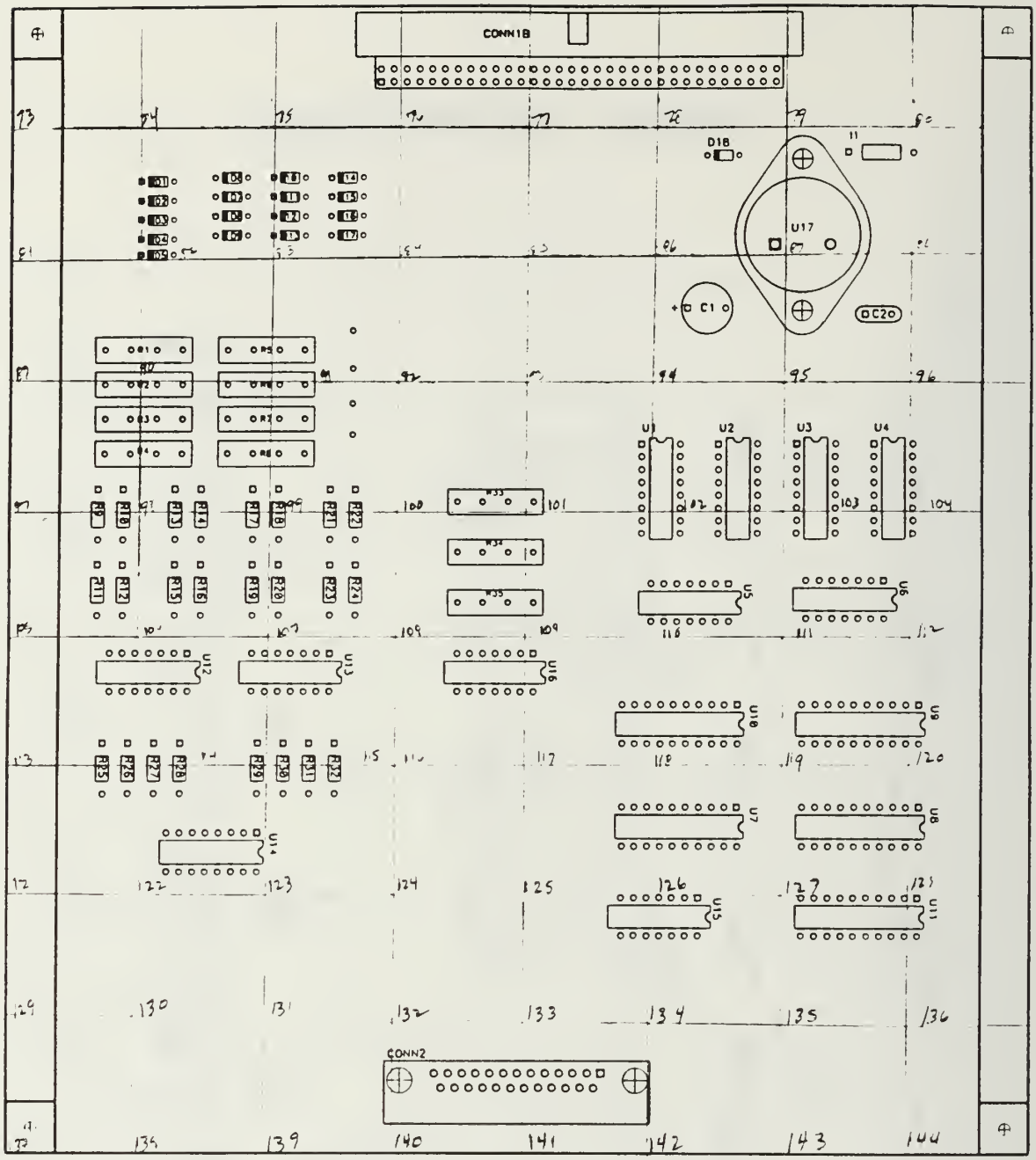
PANSAT - STEADY STATE - SHADOW ZONE - WITH INTERNAL HEAT DISSIPATION

Temperatures, degC

1	-19.14	2	-19.99	3	-20.56	4	-18.34	5	-19.32	6	-19.99
7	-16.10	8	-17.14	9	-17.65	10	-21.82	11	-21.92	12	-21.63
13	-20.83	14	-20.72	15	-19.87	16	-18.65	17	-18.29	18	-15.44
19	-20.86	20	-20.75	21	-20.73	22	-20.03	23	-20.14	24	-20.19
25	-17.47	26	-17.81	27	-17.93	28	-20.84	29	-20.63	30	-19.70
31	-20.23	32	-19.81	33	-18.54	34	-18.17	35	-17.85	36	-16.89
37	-15.75	38	-14.72	39	-13.46	40	-14.94	41	-13.27	42	-11.58
43	-13.84	44	-12.45	45	-11.21	46	-10.08	47	-9.24	48	-8.99
49	-7.89	50	-6.78	51	-6.50	52	-8.06	53	-7.29	54	-7.12
55	-9.28	56	-9.74	57	-10.81	58	-6.96	59	-7.61	60	-9.01
61	-7.67	62	-8.18	63	-9.19	64	-14.46	65	-15.52	66	-16.85
67	-13.05	68	-14.63	69	-15.68	70	-12.57	71	-13.70	72	-14.61
73	-22.36	74	-24.09	75	-25.30	76	-22.12	77	-23.14	78	-24.54
79	-20.75	80	-21.69	81	-22.36	82	-25.89	83	-25.88	84	-24.88
85	-24.87	86	-23.35	87	-23.37	88	-25.80	89	-25.26	90	-24.27
91	-24.93	92	-24.34	93	-22.48	94	-22.66	95	-22.31	96	-21.87
97	-23.37	98	-23.22	99	-22.69	100	-22.34	101	-22.11	102	-21.47
103	-22.51	104	-20.87	105	-18.13	106	-21.13	107	-19.28	108	-16.09
109	-19.15	110	-17.80	111	-15.57	112	-15.17	113	-15.02	114	-12.88
115	-12.24	116	-11.56	117	-10.70	118	-15.61	119	-17.25	120	-18.41
121	-13.71	122	-14.89	123	-15.65	124	-12.85	125	-13.81	126	-14.76
127	-19.81	128	-20.18	129	-18.39	130	-18.92	131	-16.96	132	-18.62
133	-15.03	134	-15.38	135	-17.14	136	-15.21	137	-17.17	138	-18.68
139	-14.50	140	-17.04	141	-18.87	142	-18.88	143	-16.47	144	-19.43
145	-19.44	146	-19.59	147	-19.64	148	-17.73	149	-17.47	150	-17.44
151	-19.37	152	-19.00	153	-18.53	154	-19.44	155	-18.79	156	-18.08
157	-18.05	158	-17.21	159	-18.05	160	-17.13	161	-17.16	162	-16.83
163	-13.53	164	-11.66	165	-10.02	166	-13.95	167	-11.47	168	-8.60
169	-14.16	170	-11.15	171	-7.36	172	-8.40	173	-7.93	174	-7.32
175	-6.85	176	-2.19	177	-2.04	178	-8.09	179	-9.45	180	-9.89
181	-6.35	182	-7.57	183	-9.09	184	-5.65	185	-7.91	186	-9.34
187	-12.97	188	-14.11	189	-12.09	190	-13.32	191	-11.10	192	-11.38
193	-20.05	194	-22.76	195	-24.46	196	-21.20	197	-24.10	198	-25.41
199	-21.99	200	-24.54	201	-25.83	202	-10.78	203	-13.59	204	-15.85
205	-12.25	206	-14.59	207	-16.46	208	-13.09	209	-15.07	210	-17.72
211	-18.92	212	-19.12	213	-19.11	214	-18.23	215	-15.99	216	-14.82
217	-14.09	218	-14.19	219	-13.66	220	-14.04	221	-14.20	222	-13.39
223	-12.32	224	-11.53	225	-11.48	226	-12.52	227	-13.80	228	-12.66
229	-14.06	230	-13.35	231	-14.59	232	-13.79				
301	-272.80										

APPENDIX C. EPS NODE DIVISIONS




CONN1B
D18
U17
C1
C20
U1
U2
U3
U4
U5
U6
U7
U8
U9
U10
U11
U12
U13
U14
U15
U16
CONN2

APPENDIX D. THANSS/TASS INPUT FILE

```
 PRINTED CIRCUIT BOARDS - S. PATTERSON - RUN B
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    0      0      0
  300     50      6      2      4      6      0      0      0      0
.500000E-01 .666670              12 .800000     77.0000
92.3000      92.3000      92.3000
    5     21           91          733         3011         3033
.759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03
    5     11           31          101          743         3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
    5     21           41          111          753         3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
    5     31           51          121          763         3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
    5     41           61          131          773         3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
   .6     51           71          141          783         3033         9991
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .102390E-01
    6     61           81          151          793         3033         9991
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .682600E-02
    6     71          161          803         3011         3033         9991
.759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03 .102390E-01
    7     11          101          171          813         3011         3033         9
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03 .682600E
    7     21           91          111          181          823         3033         9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .139933
    7     31          101          121          191          833         3033         9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .139933
    7     41          111          131          201          843         3033         9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .546080E
    7     51          121          141          211          853         3033         9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .682600E
    7     61          131          151          221          863         3033         9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .682600E
    7     71          141          161          231          873         3033         9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .170650E
    7     81          151          241          883         3011         3033         9
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .000000      .801852E-03 .204780E
    7     91          181          251          893         3011         3033         9
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03 .170650E
    7    101          171          191          261          903         3033         9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .204780E
    7    111          181          201          271          913         3033         9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .136520E
    7    121          191          211          281          923         3033         9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .136520E
    7    131          201          221          291          933         3033         9
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    7    141          211          231          301          943         3033         9
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    7    151          221          241          311          953         3033         9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .136520E
    7    161          231          321          963         3011         3033         9
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03 .307170E
    7    171          261          331          973         3011         3033         9
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```

```
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    0     0     0
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.500000E-01 .666670              12 .800000     77.0000
92.3000     92.3000     92.3000
    5    21          91         733        3011        3033
.759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03
    5    11          31         101         743        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
    5    21          41         111         753        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
    5    31          51         121         763        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
    5    41          61         131         773        3033
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03
    6    51          71         141         783        3033        9991
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .102390E-01
    6    61          81         151         793        3033        9991
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .682600E-02
    6    71         161         803        3011        3033        9991
.759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03 .102390E-01
    7    11         101         171         813        3011        3033          9
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03 .682600E
    7    21          91         111         181         823        3033          9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .139933
    7    31         101         121         191         833        3033          9
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    7    41         111         131         201         843        3033          9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .546080E
    7    51         121         141         211         853        3033          9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .682600E
    7    61         131         151         221         863        3033          9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .682600E
    7    71         141         161         231         873        3033          9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .170650E
    7    81         151         241         883        3011        3033          9
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .000000     .801852E-03 .204780E
    7    91         181         251         893        3011        3033          9
.759341E-01 .759341E-01 .759341E-01 .801852E-03 .208850E-01 .801852E-03 .170650E
    7   101         171         191         261         903        3033          9
.759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .801852E-03 .204780E
    7   111         181         201         271         913        3033          9
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    7   121         191         211         281         923        3033          9
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    7   131         201         221         291         933        3033          9
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    7   141         211         231         301         943        3033          9
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    7   151         221         241         311         953        3033          9
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   6    471          541          561          631          1273         3033
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6 521 591 611 681 1323 3033
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6 531 601 621 691 1333 3033
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6 551 621 641 711 1353 3033
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   7    183          821          891          911          981         3023         9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .238910E
   7    193          831          901          921          991         3023         9
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   6    203          841          911          931         1001         3023
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   6    213          851          921          941         1011         3023
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   7    223          861          931          951         1021         3023         9
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   7    233          871          941          961         1031         3023         9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .307170
   6    243          881          951         1041         3011         3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .208850E-01 .801852E-03
   7    253          891          981         1051         3011         3022         9
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   7    263          901          971          991         1061         3023         9
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   7    273          911          981         1001         1071         3023         9
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   7    283          921          991         1011         1081         3023         9
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   7    303          941         1011         1031         1101         3023         9
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   7    313          951         1021         1041         1111         3023         9
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   6    323          961         1031         1121         3011         3023
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   6    333          971         1061         1131         3011         3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .208850E-01 .801852E-03
   6    343          981         1051         1071         1141         3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03
   6    353          991         1061         1081         1151         3023
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   7    373         1011         1081         1101         1171         3023         9
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   7    383         1021         1091         1111         1181         3023         9
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   6    403         1041         1111         1201         3011         3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .208850E-01 .801852E-03
   7    413         1051         1141         1211         3011         3023         9
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   7    423         1061         1131         1151         1221         3023         9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .648470E
   7    433         1071         1141         1161         1231         3023         9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .648470E
   6    443         1081         1151         1171         1241         3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03
   7    453         1091         1161         1181         1251         3023         9
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   7    473          1111          1181          1201          1271          3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .853250E
   6    483          1121          1191          1281          3011          3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .208850E-01 .801852E-03
   6    493          1131          1221          1291          3011          3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .208850E-01 .801852E-03
   7    503          1141          1211          1231          1301          3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .853250E
   6    513          1151          1221          1241          1311          3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03
   6    523          1161          1231          1251          1321          3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03
   7    533          1171          1241          1261          1331          3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .341300E
   7    543          1181          1251          1271          1341          3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .511950E
   7    553          1191          1261          1281          1351          3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .853250E
   6    563          1201          1271          1361          3011          3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .208850E-01 .801852E-03
   6    573          1211          1301          1371          3011          3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .208850E-01 .801852E-03
   6    583          1221          1291          1311          1381          3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03
   6    593          1231          1301          1321          1391          3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03
   6    603          1241          1311          1331          1401          3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03
   7    613          1251          1321          1341          1411          3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .341300E
   7    623          1261          1331          1351          1421          3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .511950E
   7    633          1271          1341          1361          1431          3023          9
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .759341E-01 .801852E-03 .853250E
   6    643          1281          1351          1441          3011          3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .208850E-01 .801852E-03
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.801852E-03 .759341E-01 .759341E-01 .208850E-01 .801852E-03
   5    663          1301          1371          1391          3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
   5    673          1311          1381          1401          3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
   5    683          1321          1391          1411          3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
   5    693          1331          1401          1421          3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
   5    703          1341          1411          1431          3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
   5    713          1351          1421          1441          3023
.801852E-03 .759341E-01 .759341E-01 .759341E-01 .801852E-03
   5    723          1361          1431          3011          3023
.801852E-03 .759341E-01 .759341E-01 .208850E-01 .801852E-03
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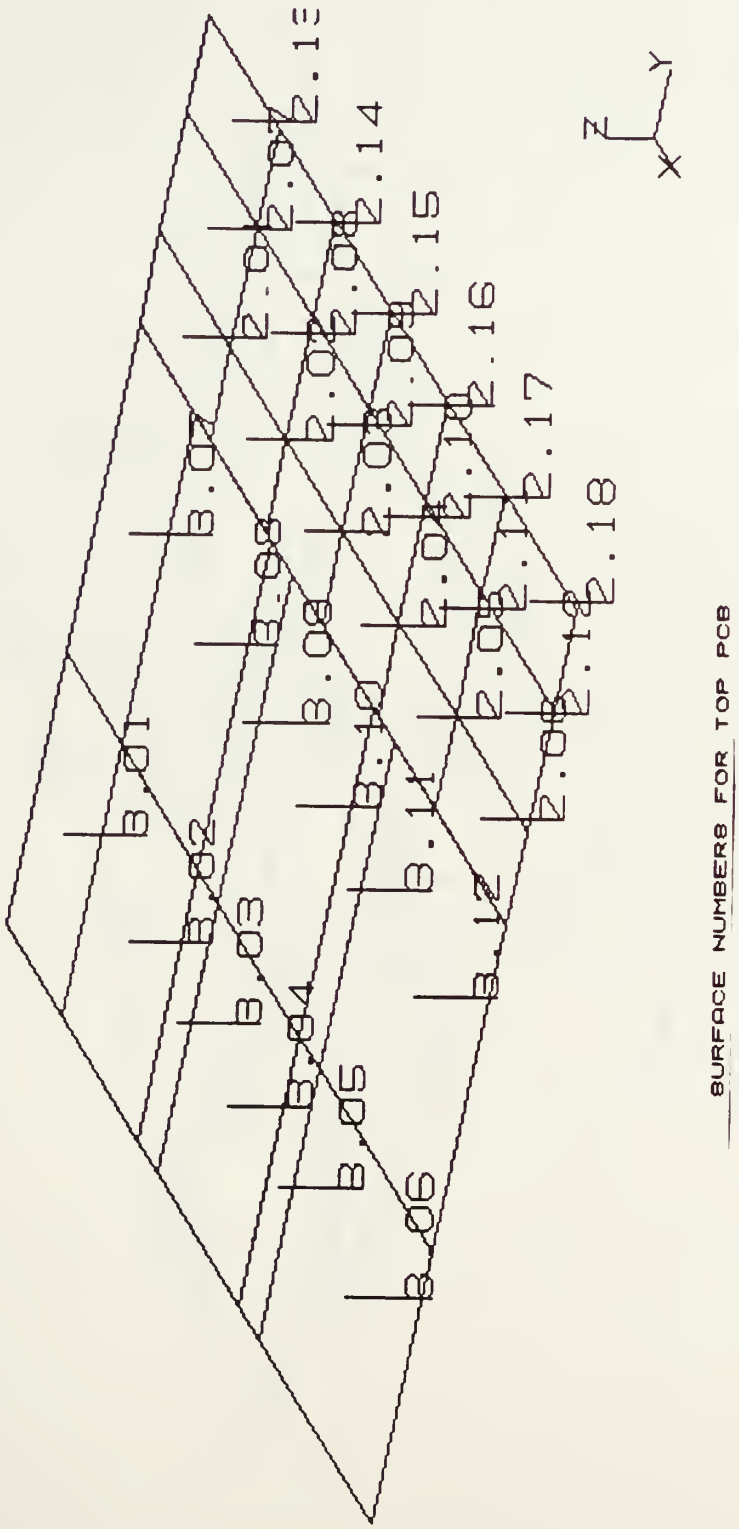
APPENDIX E. HEAT DISSIPATIONS BY NODE

NODE	WATTS	NODE	WATTS	NODE	WATTS	NODE	WATTS
6	.003	25	.02	49	.023	102	.018
7	.002	26	.041	90	.010	103	.036
8	.003	27	.020	91	.025	108	.120
8	.020	26	.030	57	.003	109	.030
10	.041	90	.001	98	.023	110	.018
11	.011	31	.003	82	.060	111	.018
12	.016	33	.001	83	.053	113	.015
13	.002	34	.006	86	.090	114	.019
14	.002	39	.014	87	.125	118	.015
19	.005	36	.008	89	.003	117	.010
16	.005	37	.050	90	.007	118	.010
17	.005	39	.003	91	.008	118	.025
16	.006	40	.001	94	.070	122	.025
19	.004	41	.023	95	.000	125	.010
20	.004	47	.046	97	.007	125	.015
21	.002	45	.002	86	.015	127	.025
22	.004	46	.001	99	.007	133	.010
23	.004	47	.005	100	.100	134	.010
24	.009	48	.001	101	.018	135	.025

PCB HEAT DISSIPATIONS BY NODE

APPENDIX F. SURFACE/NODE NUMBERS FOR TOP PCB



SURFACE NUMBERS FOR TOP PCB

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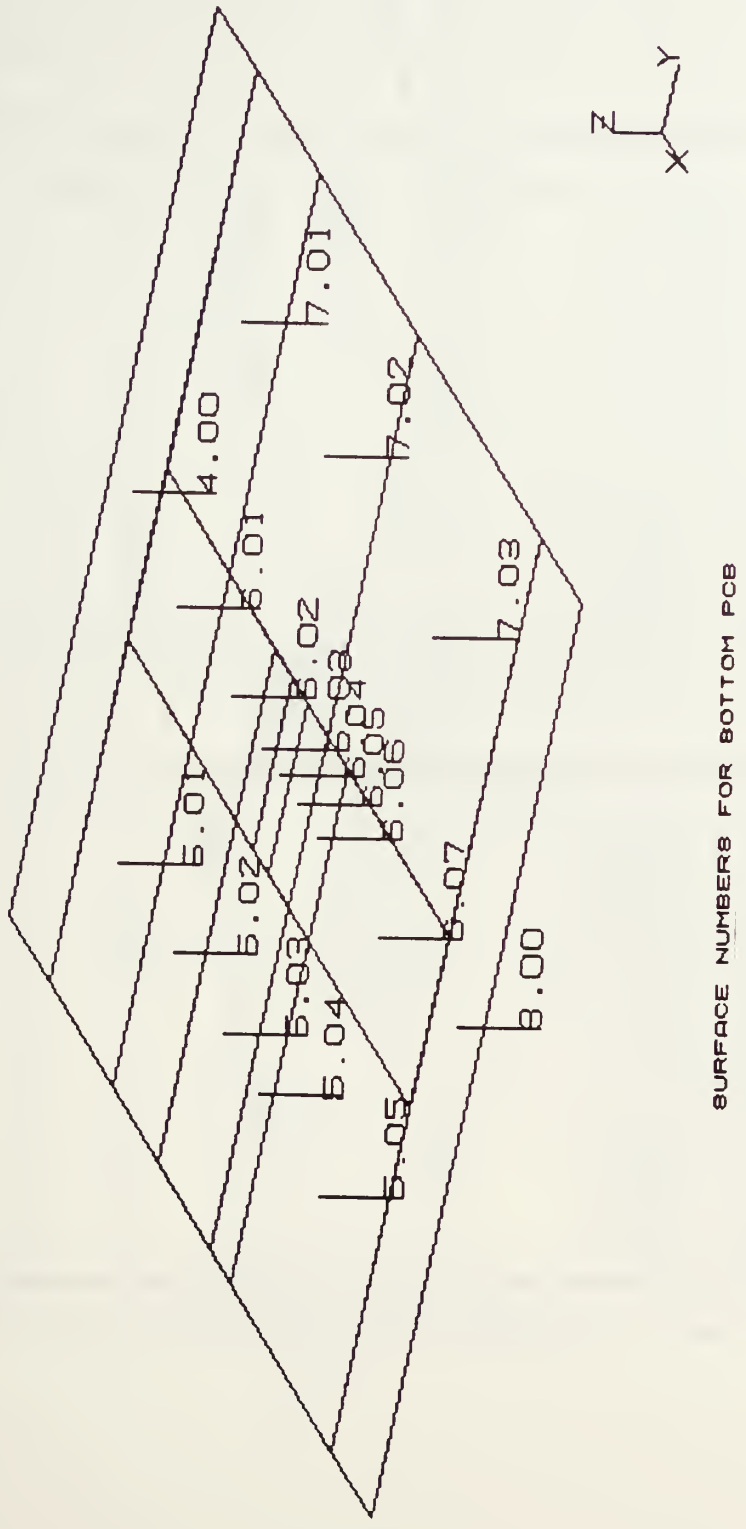
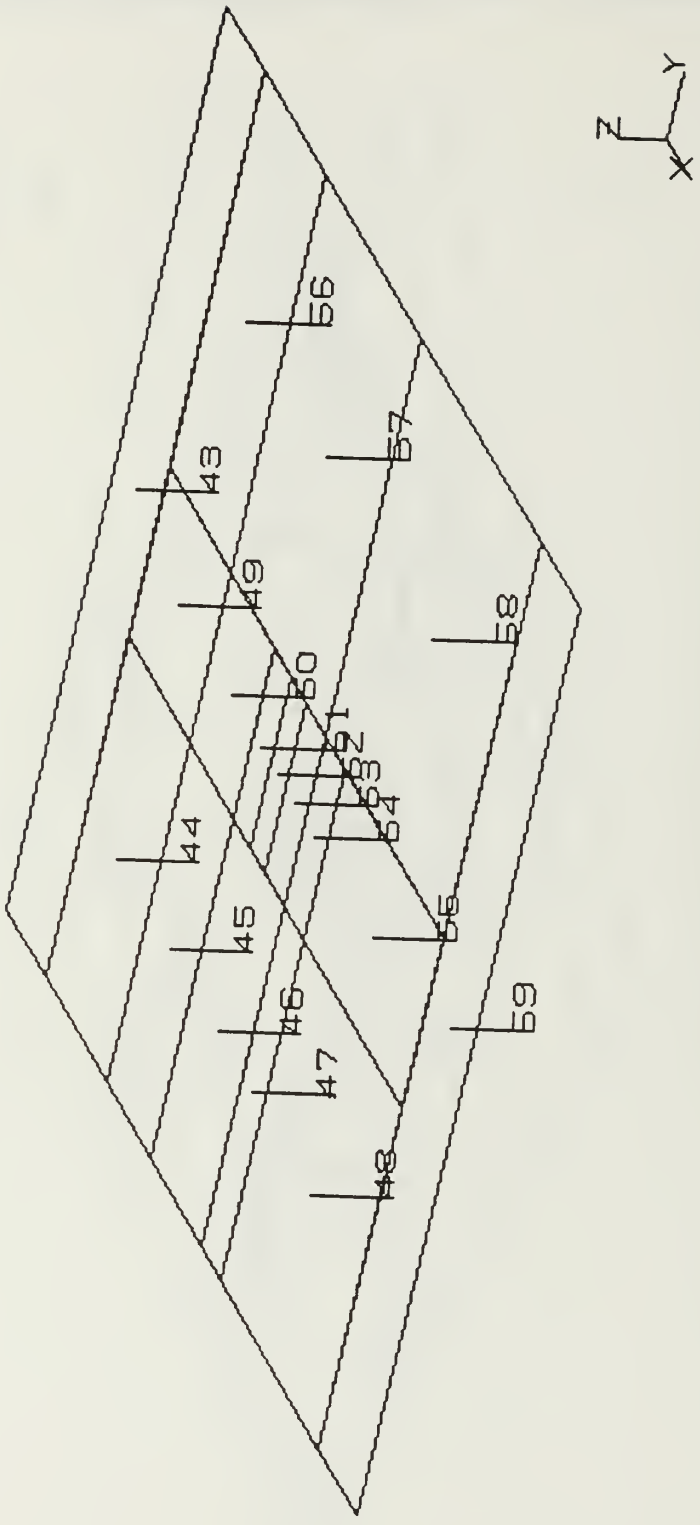
19
26
13
20
27
14
21
28
7
15
22
29
8
16
23
30
9
17
24
1
40
18
41
2
42
3
4
5
6
Z
Y
X

APPENDIX G. SURFACE/NODE NUMBERS FOR BOTTOM PCB



SURFACE NUMBERS FOR BOTTOM PCB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X
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57
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64
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APPENDIX H. OPTICAL PROPERTY DATA FOR EPS

PgDn PgUp Home End F2Help

ITAS Property Data Entry (See F2) Ctrl : Copy

Seq	Surface No	NodeNo	Alpha	Emiss	T/Mass	Dissip	MID	Comments
1	1.01	1	.4	.79	1.	0.		EPS HOUSING
2	1.02	2	.4	.79	1.	0.		EPS HOUSING
3	1.03	3	.4	.79	1.	0.		EPS HOUSING
4	1.04	4	.4	.79	1.	0.		EPS HOUSING
5	1.05	5	.4	.79	1.	0.		EPS HOUSING
6	1.06	6	.4	.79	1.	0.		EPS HOUSING
7	1.07	7	.4	.79	1.	0.		EPS HOUSING
8	1.08	8	.4	.79	1.	0.		EPS HOUSING
9	1.09	9	.4	.79	1.	0.		EPS HOUSING
10	1.10	10	.4	.79	1.	0.		EPS HOUSING
11	1.11	11	.4	.79	1.	0.		EPS HOUSING
12	1.12	12	.4	.79	1.	0.		EPS HOUSING
13	2.01	13	0.	.01	1.	0.		PRINTED CIRCUIT 1
14	2.02	14	0.	.01	1.	0.		PRINTED CIRCUIT 1
15	2.03	15	0.	.01	1.	0.		PRINTED CIRCUIT 1
16	2.04	16	0.	.01	1.	0.		PRINTED CIRCUIT 1
17	2.05	17	0.	.01	1.	0.		PRINTED CIRCUIT 1
18	2.06	18	0.	.01	1.	0.		PRINTED CIRCUIT 1

S-F1Load/Save All S-F4Auto TM UDC Allowed ESCQuit
F1Load/Save Page F3PropLib F4AutoGen F5ImportPropFmt F6NewPropFile F10Search

PgDn PgUp Home End F2Help

ITAS Property Data Entry (See F2) Ctrl : Copy

Seq	Surface No	NodeNo	Alpha	Emiss	T/Mass	Dissip	MID	Comments
19	2.07	19	0	.01	1.	0.		PRINTED CIRCUIT 1
20	2.08	20	0	.01	1.	0.		PRINTED CIRCUIT 1
21	2.09	21	0	.01	1.	0.		PRINTED CIRCUIT 1
22	2.10	22	0	.01	1.	0.		PRINTED CIRCUIT 1
23	2.11	23	0	.01	1.	0.		PRINTED CIRCUIT 1
24	2.12	24	0	.01	1.	0.		PRINTED CIRCUIT 1
25	2.13	25	0	.01	1.	0.		PRINTED CIRCUIT 1
26	2.14	26	0	.01	1.	0.		PRINTED CIRCUIT 1
27	2.15	27	0	.01	1.	0.		PRINTED CIRCUIT 1
28	2.16	28	0	.01	1.	0.		PRINTED CIRCUIT 1
29	2.17	29	0	.01	1.	0.		PRINTED CIRCUIT 1
30	2.18	30	0	.01	1.	0.		PRINTED CIRCUIT 1
31	3.01	31	0	.01	1.	0.		PRINTED CIRCUIT 1
32	3.02	32	0	.01	1.	0.		PRINTED CIRCUIT 1
33	3.03	33	0	.01	1.	0.		PRINTED CIRCUIT 1
34	3.04	34	0	.01	1.	0.		PRINTED CIRCUIT 1
35	3.05	35	0	.01	1.	0.		PRINTED CIRCUIT 1
36	3.06	36	0	.01	1.	0.		PRINTED CIRCUIT 1

S-F1Load/Save All S-F4Auto TM UDC Allowed ESCQuit
F1Load/Save Page F3PropLib F4AutoGen F5ImportPropFmt F6NewPropFile F10Search

PgDn PgUp Home End F2Help

Ctrl : Copy (See F2) ITAS Property Data Entry

Seq	Surface No	NodeNo	Alpha	Emiss	T/Mass	Dissip	MID	Comments
37	3.07	37	0.	.01	1.	0.		PRINTED CIRCUIT 1
38	3.08	38	0.	.01	1.	0.		PRINTED CIRCUIT 1
39	3.09	39	0.	.01	1.	0.		PRINTED CIRCUIT 1
40	3.10	40	0.	.01	1.	0.		PRINTED CIRCUIT 1
41	3.11	41	0.	.01	1.	0.		PRINTED CIRCUIT 1
42	3.12	42	0.	.01	1.	0.		PRINTED CIRCUIT 1
43	4.00	43	0.	.01	1.	0.		PRINTED CIRCUIT 2
44	5.01	44	0.	.01	1.	0.		PRINTED CIRCUIT 2
45	5.02	45	0.	.01	1.	0.		PRINTED CIRCUIT 2
46	5.03	46	0.	.01	1.	0.		PRINTED CIRCUIT 2
47	5.04	47	0.	.01	1.	0.		PRINTED CIRCUIT 2
48	5.05	48	0.	.01	1.	0.		PRINTED CIRCUIT 2
49	6.01	49	0.	.01	1.	0.		PRINTED CIRCUIT 2
50	6.02	50	0.	.01	1.	0.		PRINTED CIRCUIT 2
51	6.03	51	0.	.01	1.	0.		PRINTED CIRCUIT 2
52	6.04	52	0.	.01	1.	0.		PRINTED CIRCUIT 2
53	6.05	53	0.	.01	1.	0.		PRINTED CIRCUIT 2
54	6.06	54	0.	.01	1.	0.		PRINTED CIRCUIT 2

S-F1Load/Save All S-F4Auto TM UDC Allowed ESCQuit
F1Load/Save Page F3PropLib F4AutoGen F5ImportPropFmt F6NewPropFile F10Search

PgDn PgUp Home End F2Help

Ctrl : Copy (See F2) ITAS Property Data Entry

Seq	Surface No	NodeNo	Alpha	Emiss	T/Mass	Dissip	MID	Comments
42	3.12	42	0.	.01	1.	0.		PRINTED CIRCUIT 1
43	4.00	43	0.	.01	1.	0.		PRINTED CIRCUIT 2
44	5.01	44	0.	.01	1.	0.		PRINTED CIRCUIT 2
45	5.02	45	0.	.01	1.	0.		PRINTED CIRCUIT 2
46	5.03	46	0.	.01	1.	0.		PRINTED CIRCUIT 2
47	5.04	47	0.	.01	1.	0.		PRINTED CIRCUIT 2
48	5.05	48	0.	.01	1.	0.		PRINTED CIRCUIT 2
49	6.01	49	0.	.01	1.	0.		PRINTED CIRCUIT 2
50	6.02	50	0.	.01	1.	0.		PRINTED CIRCUIT 2
51	6.03	51	0.	.01	1.	0.		PRINTED CIRCUIT 2
52	6.04	52	0.	.01	1.	0.		PRINTED CIRCUIT 2
53	6.05	53	0.	.01	1.	0.		PRINTED CIRCUIT 2
54	6.06	54	0.	.01	1.	0.		PRINTED CIRCUIT 2
55	6.07	55	0.	.01	1.	0.		PRINTED CIRCUIT 2
56	7.01	56	0.	.01	1.	0.		PRINTED CIRCUIT 2
57	7.02	57	0.	.01	1.	0.		PRINTED CIRCUIT 2
58	7.03	58	0.	.01	1.	0.		PRINTED CIRCUIT 2
59	8.00	59	0.	.01	1.	0.		PRINTED CIRCUIT 2

S-F1Load/Save All S-F4Auto TM UDC Allowed ESCQuit
F1Load/Save Page F3PropLib F4AutoGen F5ImportPropFmt F6NewPropFile F10Search

APPENDIX I. THERMAL MASS FOR THE EPS

NODE	X/Y	Y/Z	thickness	kg/cubic m ro(Cu/Al/poly)	cal/kg c specific heat	CONV FACTOR	IN TO M	cubic meters VOLUME	THERMAL MASS
901	9 4	1 569	0.2	2787	0 199	69 78	61024	4 8337E-05	1 870687
902	2 1	1 569	0 2	2787	0 199	69 78	61024	1 07987E-05	0 417919
903	2 1	1 569	0 2	2787	0 199	69 78	61024	1 07987E-05	0 417919
904	2 1	1 569	0.2	2787	0 199	69 78	61024	1 07987E-05	0 417919
905	2 1	1 569	0.2	2787	0 199	69 78	61024	1 07987E-05	0 417919
906	9 4	8 4	0 2	2787	0 199	69 78	61024	0 000258783	10 01515
907	9 4	1 569	0 2	2787	0 199	69 78	61024	4 8337E-05	1 870687
908	2 1	1 569	0.2	2787	0 199	69 78	61024	1 07987E-05	0 417919
909	2 1	1 569	0.2	2787	0 199	69 78	61024	1 07987E-05	0 417919
910	2 1	1 569	0 2	2787	0 199	69 78	61024	1 07987E-05	0 417919
911	2 1	1 569	0 2	2787	0 199	69 78	61024	1 07987E-05	0 417919
912	9 4	8 4	0 2	2787	0 199	69 78	61024	0 000258783	10 01515
-913	9 4	8 4	0 125	2787	0 199	69 78	61024	0 00016174	6 259469
921	8 4	0 25	0 2	2787	0 199	69 78	61024	6 88254E-06	0 26636
922	8 4	0 375	0.2	2787	0 199	69 78	61024	1 03238E-05	0 399541
923	8 4	0 199	0 2	2787	0 199	69 78	61024	5 4785E-06	0 212023
924	8 4	2 5	0 2	2787	0 199	69 78	61024	6 88254E-05	2 663604
925	8 4	0 375	0.2	2787	0 199	69 78	61024	1 03238E-05	0 399541
926	8 4	0 199	0 2	2787	0 199	69 78	61024	5 4785E-06	0 212023
601	1 375	2 375	0 00134	8666	0 098	69 78	61024	7 17085E-08	0 00425
602	1 875	2.375	0.00134	8666	0 098	69 78	61024	9 77843E-08	0 005795
603	0 5	2 375	0 00134	8666	0 098	69 78	61024	2 60758E-08	0 001545
604	2	2 375	0 00134	8666	0 098	69 78	61024	1 04303E-07	0 006181
605	0 5	2 375	0 00134	8666	0 098	69 78	61024	2 60758E-08	0 001545
606	2 75	2 375	0 00134	8666	0 098	69 78	61024	1 43417E-07	0 008499
607	1.375	2 875	0 00134	8666	0 098	69 78	61024	8 6805E-08	0 005144
608	1 875	2 875	0.00134	8666	0 098	69 78	61024	1 1837E-07	0 007015
609	0 5	2 875	0 00134	8666	0 098	69 78	61024	3 15654E-08	0 001871
610	2	2 875	0 00134	8666	0 098	69 78	61024	1 26262E-07	0 007483
611	0 5	2 875	0 00134	8666	0 098	69 78	61024	3 15654E-08	0 001871
612	2 75	2 875	0 00134	8666	0 098	69 78	61024	1 7361E-07	0 010288
613	1 75	0 8125	0 00134	8666	0 098	69 78	61024	3 12223E-08	0 00185

614	1.375	0.8125	0.00134	8666	0.098	69.78	61024	2.45318E-08	0.001454
615	1.375	0.8125	0.00134	8666	0.098	69.78	61024	2.45318E-08	0.001454
616	1.375	0.8125	0.00134	8666	0.098	69.78	61024	2.45318E-08	0.001454
617	1.375	0.8125	0.00134	8666	0.098	69.78	61024	2.45318E-08	0.001454
618	1.75	0.8125	0.00134	8666	0.098	69.78	61024	3.12223E-08	0.00185
619	1.75	1.0625	0.00134	8666	0.098	69.78	61024	4.08292E-08	0.00242
620	1.375	1.0625	0.00134	8666	0.098	69.78	61024	3.20801E-08	0.001901
621	1.375	1.0625	0.00134	8666	0.098	69.78	61024	3.20801E-08	0.001901
622	1.375	1.0625	0.00134	8666	0.098	69.78	61024	3.20801E-08	0.001901
623	1.375	1.0625	0.00134	8666	0.098	69.78	61024	3.20801E-08	0.001901
624	1.75	1.0625	0.00134	8666	0.098	69.78	61024	4.08292E-08	0.00242
625	1.375	0.875	0.00134	8666	0.098	69.78	61024	2.64189E-08	0.001566
626	1.375	0.875	0.00134	8666	0.098	69.78	61024	2.64189E-08	0.001566
627	1.375	0.875	0.00134	8666	0.098	69.78	61024	2.64189E-08	0.001566
628	1.375	0.875	0.00134	8666	0.098	69.78	61024	2.64189E-08	0.001566
629	1.375	0.875	0.00134	8666	0.098	69.78	61024	2.64189E-08	0.001566
630	1.75	0.875	0.00134	8666	0.098	69.78	61024	3.36241E-08	0.001993
1601	8	1	0.00134	8666	0.098	69.78	61024	1.75669E-07	0.01041
1602	3	1.563	0.00134	8666	0.098	69.78	61024	1.02964E-07	0.006102
1603	3	1.125	0.00134	8666	0.098	69.78	61024	7.41102E-08	0.004392
1604	3	1.3125	0.00134	8666	0.098	69.78	61024	8.64619E-08	0.005124
1605	3	0.5	0.00134	8666	0.098	69.78	61024	3.29379E-08	0.001952
1606	3	2.5	0.00134	8666	0.098	69.78	61024	1.64689E-07	0.00976
1607	1.5	1.563	0.00134	8666	0.098	69.78	61024	5.14819E-08	0.003051
1608	1.5	1.125	0.00134	8666	0.098	69.78	61024	3.70551E-08	0.002196
1609	1.5	1.4375	0.00134	8666	0.098	69.78	61024	4.73482E-08	0.002806
1610	1.5	0.375	0.00134	8666	0.098	69.78	61024	1.23517E-08	0.000732
1611	1.5	0.5	0.00134	8666	0.098	69.78	61024	1.64689E-08	0.000976
1612	1.5	0.5	0.00134	8666	0.098	69.78	61024	1.64689E-08	0.000976
1613	1.5	2.5	0.00134	8666	0.098	69.78	61024	8.23447E-08	0.00488
1614	3.5	1.563	0.00134	8666	0.098	69.78	61024	1.20124E-07	0.007119
1615	3.5	2.4375	0.00134	8666	0.098	69.78	61024	1.87334E-07	0.011102
1616	3.5	3	0.00134	8666	0.098	69.78	61024	2.30565E-07	0.013664
1617	3.5	1	0.00134	8666	0.098	69.78	61024	7.6855E-08	0.004555
501	1.375	2.375	0.01933	1950	0.31	69.78	61024	1.03442E-06	0.043634
502	1.875	2.375	0.01933	1950	0.31	69.78	61024	1.41057E-06	0.059501
503	0.5	2.375	0.01933	1950	0.31	69.78	61024	3.76153E-07	0.015867

504	2	2.375	0.01933	1950	0.31	69.78	61024	1.50461E-06	0.063468
505	0.5	2.375	0.01933	1950	0.31	69.78	61024	3.76153E-07	0.015867
506	2.75	2.375	0.01933	1950	0.31	69.78	61024	2.06884E-06	0.087268
507	1.375	2.875	0.01933	1950	0.31	69.78	61024	1.25219E-06	0.05282
508	1.875	2.875	0.01933	1950	0.31	69.78	61024	1.70754E-06	0.072027
509	0.5	2.875	0.01933	1950	0.31	69.78	61024	4.55343E-07	0.019207
510	2	2.875	0.01933	1950	0.31	69.78	61024	1.82137E-06	0.076829
511	0.5	2.875	0.01933	1950	0.31	69.78	61024	4.55343E-07	0.019207
512	2.75	2.875	0.01933	1950	0.31	69.78	61024	2.50439E-06	0.10564
513	1.75	0.8125	0.01933	1950	0.31	69.78	61024	4.50394E-07	0.018999
514	1.375	0.8125	0.01933	1950	0.31	69.78	61024	3.53881E-07	0.014927
515	1.375	0.8125	0.01933	1950	0.31	69.78	61024	3.53881E-07	0.014927
516	1.375	0.8125	0.01933	1950	0.31	69.78	61024	3.53881E-07	0.014927
517	1.375	0.8125	0.01933	1950	0.31	69.78	61024	3.53881E-07	0.014927
518	1.75	0.8125	0.01933	1950	0.31	69.78	61024	4.50394E-07	0.018999
519	1.75	1.0625	0.01933	1950	0.31	69.78	61024	5.88977E-07	0.024844
520	1.375	1.0625	0.01933	1950	0.31	69.78	61024	4.62767E-07	0.01952
521	1.375	1.0625	0.01933	1950	0.31	69.78	61024	4.62767E-07	0.01952
522	1.375	1.0625	0.01933	1950	0.31	69.78	61024	4.62767E-07	0.01952
523	1.375	1.0625	0.01933	1950	0.31	69.78	61024	4.62767E-07	0.01952
524	1.75	1.0625	0.01933	1950	0.31	69.78	61024	5.88977E-07	0.024844
525	1.375	0.875	0.01933	1950	0.31	69.78	61024	3.81103E-07	0.016076
526	1.375	0.875	0.01933	1950	0.31	69.78	61024	3.81103E-07	0.016076
527	1.375	0.875	0.01933	1950	0.31	69.78	61024	3.81103E-07	0.016076
528	1.375	0.875	0.01933	1950	0.31	69.78	61024	3.81103E-07	0.016076
529	1.375	0.875	0.01933	1950	0.31	69.78	61024	3.81103E-07	0.016076
530	1.75	0.875	0.01933	1950	0.31	69.78	61024	4.8504E-07	0.02046
1501	8	1	0.01933	1950	0.31	69.78	61024	2.53408E-06	0.106893
1502	3	1.563	0.01933	1950	0.31	69.78	61024	1.48529E-06	0.062653
1503	3	1.125	0.01933	1950	0.31	69.78	61024	1.06907E-06	0.045095
1504	3	1.3125	0.01933	1950	0.31	69.78	61024	1.24724E-06	0.052611
1505	3	0.5	0.01933	1950	0.31	69.78	61024	4.75141E-07	0.020042
1506	3	2.5	0.01933	1950	0.31	69.78	61024	2.3757E-06	0.100212
1507	1.5	1.563	0.01933	1950	0.31	69.78	61024	7.42645E-07	0.031326
1508	1.5	1.125	0.01933	1950	0.31	69.78	61024	5.34534E-07	0.022548
1509	1.5	1.4375	0.01933	1950	0.31	69.78	61024	6.83015E-07	0.028811
1510	1.5	0.375	0.01933	1950	0.31	69.78	61024	1.78178E-07	0.007516

PIN THERMAL MASSES

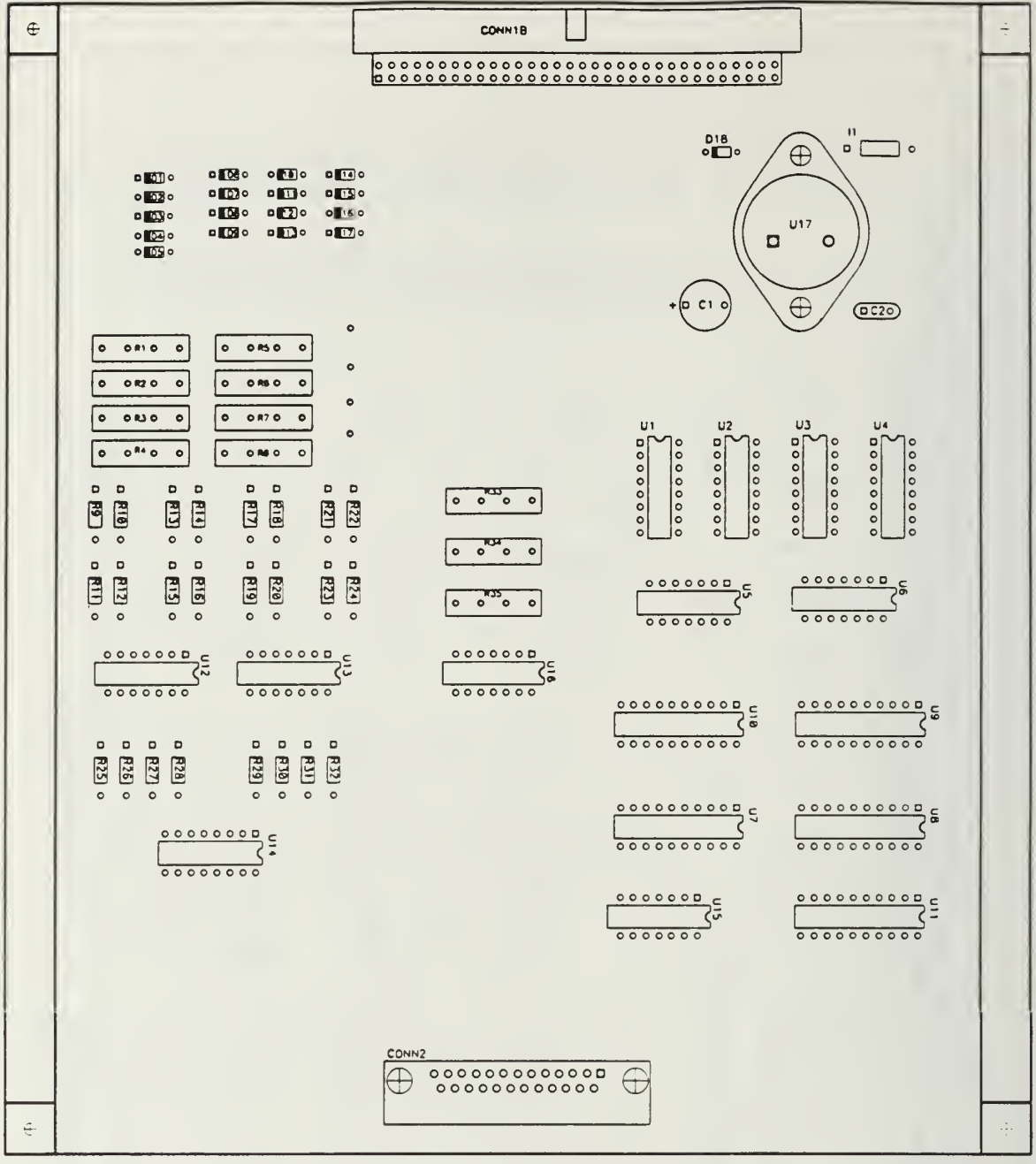
NODE	# OF PINS	pi	RADIUS	HEIGHT	VOLUME	cal/kg C c	kg/cubic m ro	CONV. FACTOR	cubic in to cubic m	THERMAL MASS
2011	6	3.14159	0.0165	0.01933	9.92E-05	0.11	8378	69.78	61024	0.000105
2012	6	3.14159	0.0165	0.00134	6.88E-06	0.11	8378	69.78	61024	7.25E-06
2021	23	3.14159	0.0165	0.01933	0.00038	0.11	8378	69.78	61024	0.000401
2022	23	3.14159	0.0165	0.00134	2.64E-05	0.11	8378	69.78	61024	2.78E-05
2031	4	3.14159	0.0165	0.01933	6.61E-05	0.11	8378	69.78	61024	6.97E-05
2032	4	3.14159	0.0165	0.00134	4.58E-06	0.11	8378	69.78	61024	4.83E-06
2041	25	3.14159	0.0165	0.01933	0.000413	0.11	8378	69.78	61024	0.000436
2042	25	3.14159	0.0165	0.00134	2.87E-05	0.11	8378	69.78	61024	3.02E-05
2051	3	3.14159	0.0165	0.01933	4.96E-05	0.11	8378	69.78	61024	5.23E-05
2052	3	3.14159	0.0165	0.00134	3.44E-06	0.11	8378	69.78	61024	3.62E-06
2121	12	3.14159	0.0165	0.01933	0.000198	0.11	8378	69.78	61024	0.000209
2122	12	3.14159	0.0165	0.00134	1.38E-05	0.11	8378	69.78	61024	1.45E-05
2131	8	3.14159	0.0165	0.01933	0.000132	0.11	8378	69.78	61024	0.000139
2132	8	3.14159	0.0165	0.00134	9.17E-06	0.11	8378	69.78	61024	9.66E-06
2191	14	3.14159	0.0165	0.01933	0.000231	0.11	8378	69.78	61024	0.000244
2192	14	3.14159	0.0165	0.00134	1.6E-05	0.11	8378	69.78	61024	1.69E-05
3011	64	3.14159	0.0165	0.01933	0.001058	0.11	8378	69.78	61024	0.001115
3012	64	3.14159	0.0165	0.00134	7.34E-05	0.11	8378	69.78	61024	7.73E-05
3021	34	3.14159	0.0165	0.01933	0.000562	0.11	8378	69.78	61024	0.000592
3022	34	3.14159	0.0165	0.00134	3.9E-05	0.11	8378	69.78	61024	4.11E-05
3031	32	3.14159	0.0165	0.01933	0.000529	0.11	8378	69.78	61024	0.000558
3032	32	3.14159	0.0165	0.00134	3.67E-05	0.11	8378	69.78	61024	3.86E-05
3051	28	3.14159	0.0165	0.01933	0.000463	0.11	8378	69.78	61024	0.000488
3052	28	3.14159	0.0165	0.00134	3.21E-05	0.11	8378	69.78	61024	3.38E-05
3141	10	3.14159	0.0165	0.01933	0.000165	0.11	8378	69.78	61024	0.000174
3142	10	3.14159	0.0165	0.00134	1.15E-05	0.11	8378	69.78	61024	1.21E-05
3151	100	3.14159	0.0165	0.01933	0.001653	0.11	8378	69.78	61024	0.001742
3152	100	3.14159	0.0165	0.00134	0.000115	0.11	8378	69.78	61024	0.000121
3161	114	3.14159	0.0165	0.01933	0.001885	0.11	8378	69.78	61024	0.001986
3162	114	3.14159	0.0165	0.00134	0.000131	0.11	8378	69.78	61024	0.000138

Component	Designator	Subcircuit	Duty cycle	Power Dissipation, Bus = 15V (Sunlit)	Power Dissipation, Bus = 12V (Eclipse)
Inductor	I1A	DCSA Power Switch	100	0.039	0.061
Transient Voltage Suppressor	TVS1A	"	~0		
Ultra Fast Recovery Diode	UFR1A	"	~0		
12v Zener Bi-Directional	D1A	"	~0		
PMOSFET Gate Bias Resister	R1A	"	100	0.002	0.001
PMOSFET Gate Bias Resister	R2A	"	100	0.000	0.000
NMOSFET Gate Protection Resister	R3A	"	100	0.003	0.003
PMOSFET	T1A	"	100	0.006	0.009
NMOSFET	T2A	"	100	0.000	0.000
Pico Fuse	F1A	"	100	0.007	0.011
Inductor	I1B	DCSB Power Switch	100	0.039	0.061
Transient Voltage Suppressor	TVS1B	"	~0		
Ultra Fast Recovery Diode	UFR1B	"	~0		
12v Zener Bi-Directional	D1B	"	~0		
PMOSFET Gate Bias Resister	R1B	"	100	0.002	0.001
PMOSFET Gate Bias Resister	R2B	"	100	0.000	0.000
NMOSFET Gate Protection Resister	R3B	"	100	0.003	0.003
PMOSFET	T1B	"	100	0.006	0.009
NMOSFET	T2B	"	100	0.000	0.000
Pico Fuse	F1B	"	100	0.007	0.011
Inductor	I1C	RF Power Switch - ***Rx only***	70	0.010	0.015
Transient Voltage Suppressor	TVS1C	"	~0		
Ultra Fast Recovery Diode	UFR1C	"	~0		
12v Zener Bi-Directional	D1C	"	~0		
PMOSFET Gate Bias Resister	R1C	"	100	0.002	0.001
PMOSFET Gate Bias Resister	R2C	"	100	0.000	0.000
NMOSFET Gate Protection Resister	R3C	"	70	0.003	0.003
PMOSFET	T1C	"	70	0.006	0.009
NMOSFET	T2C	"	70	0.000	0.000
Pico Fuse	F1C	"	70	0.002	0.003
Inductor	I1C	RF Power Switch - ***Rx and Tx***	30	0.088	0.138
Transient Voltage Suppressor	TVS1C	"	~0		
Ultra Fast Recovery Diode	UFR1C	"	~0		
12v Zener Bi-Directional	D1C	"	~0		
PMOSFET Gate Bias Resister	R1C	"	30	0.002	0.001

Component	Designator	Subcircuit	Duty cycle	Power Dissipation, Bus = 15V (Sunlit)	Power Dissipation, Bus = 12V (Eclipse)	X-Coord	Y-Coord	
PMOSFET Gate Bias Resister	R2C	"	30	0.000	0.000			
NMOSFET Gate Protection Resister	R3C	"	30	0.003	0.003			
PMOSFET	T1C	"	30	0.014	0.021			
NMOSFET	T2C	"	30	0 000	0.000			
Pico Fuse	F1C	"	30	0.016	0.025			
Inductor	I1D	CHARG Battery A Power Switch	60	0.012	N/A	4.300	8.900	
Transient Voltage Suppressor	TVS1D	"	~0		"	5.025	8.637	
Ultra Fast Recovery Diode	UFR1D	"	~0		"	3.925	8.600	
12v Zener Bi-Directional	D1D	"	~0		"	3.750	8.125	
PMOSFET Gate Bias Resister	R1D	"	60	0.002	"	5.125	7.250	
PMOSFET Gate Bias Resister	R2D	"	60	0.000	"	4.950	7.075	
NMOSFET Gate Protection Resister	R3D	"	60	0.003	0.003	3.750	7.575	
PMOSFET	T1D	"	60	0.008	"	4.475	7.850	
NMOSFET	T2D	"	60	0.000	"	3.875	7.000	
Pico Fuse	F1D	"	60	0.002	"	5.250	8.175	
Inductor	I1E	CHARG Battery B Power Switch	60	0.050	N/A	4.300	6.475	
Transient Voltage Suppressor	TVS1E	"	~0		"	5.025	6.212	
Ultra Fast Recovery Diode	UFR1E	"	~0		"	3.925	6.175	
12v Zener Bi-Directional	D1E	"	~0		"	3.750	5.700	
PMOSFET Gate Bias Resister	R1E	"	60	0.002	"	5.125	4.825	
PMOSFET Gate Bias Resister	R2E	"	60	0.000	"	4.950	4.650	
NMOSFET Gate Protection Resister	R3E	"	60	0.003	0.003	3.750	5.150	
PMOSFET	T1E	"	60	0.008	"	4.475	5.425	
NMOSFET	T2E	"	60	0.000	"	3.875	4.575	
Pico Fuse	F1E	"	60	0.050	"	5.250	5.650	
Inductor	I1F	MUX A	30	0.006	0.009	8.400	8.875	
Transient Voltage Suppressor	TVS1F	"	~0			7.297	9.450	
Ultra Fast Recovery Diode	UFR1F	"	~0			8.125	9.225	
12v Zener Bi-Directional	D1F	"	~0			7.175	8.550	
PMOSFET Gate Bias Resister	R1F	"	30	0.002	0.001	7.175	8.950	
PMOSFET Gate Bias Resister	R2F	"	30	0.000	0.000	7.400	8.950	
NMOSFET Gate Protection Resister	R3F	"	30	0.003	0.003	7.225	8.375	
PMOSFET	T1F	"	30	0.003	0.004	7.775	9.050	
PMOSFET	T1F2	"	30	0.003	0.004	6.850	9.050	
NMOSFET	T2F	"	30	0.000	0.000	7.775	8.450	
Pico Fuse	F1F	"	100	0.001	0.002	6.475	9.125	

Component	Designator	Subcircuit	Duty cycle	Power Dissipation, Bus = 15V (Sunlit)	Power Dissipation, Bus = 12V (Eclipse)	X-Coord	Y-Coord	
Inductor	I1G	MUX B	30	0.006	0.009	8.400	7.525	
Transient Voltage Suppressor	TVS1G	"	~0			7.297	8.100	
Ultra Fast Recovery Diode	UFR1G	"	~0			8.125	7.875	
12v Zener Bi-Directional	D1G	"	~0			7.175	7.200	
PMOSFET Gate Bias Resister	R1G	"	30	0.002	0.001	7.175	7.600	
PMOSFET Gate Bias Resister	R2G	"	30	0.000	0.000	7.400	7.600	
NMOSFET Gate Protection Resister	R3G	"	30	0.003	0.003	7.225	7.025	
PMOSFET	T1G	"	30	0.003	0.004	7.775	7.700	
PMOSFET	T1G2	"	30	0.003	0.004	6.850	7.700	
NMOSFET	T2G	"	30	0.000	0.000	7.775	7.100	
Pico Fuse	F1G	"	100	0.001	0.009	6.475	7.775	
Inductor	I1H	MASS A	30	0.001	0.002	8.400	6.175	
Transient Voltage Suppressor	TVS1H	"	~0			7.297	6.750	
Ultra Fast Recovery Diode	UFR1H	"	~0			8.125	6.525	
12v Zener Bi-Directional	D1H	"	~0			7.175	5.850	
PMOSFET Gate Bias Resister	R1H	"	30	0.002	0.001	7.175	6.250	
PMOSFET Gate Bias Resister	R2H	"	30	0.000	0.000	7.400	6.250	
NMOSFET Gate Protection Resister	R3H	"	30	0.003	0.003	7.225	5.675	
PMOSFET	T1H	"	30	0.001	0.001	7.775	6.350	
PMOSFET	T1H2	"	30	0.001	0.001	6.850	6.350	
NMOSFET	T2H	"	30	0.000	0.000	7.775	5.750	
Pico Fuse	F1H	"	100	0.000	0.000	6.475	6.425	
Inductor	I1I	MASS B	30	0.001	0.002	8.400	4.825	
Transient Voltage Suppressor	TVS1I	"	~0			7.297	5.400	
Ultra Fast Recovery Diode	UFR1I	"	~0			8.125	5.175	
12v Zener Bi-Directional	D1I	"	~0			7.175	4.500	
PMOSFET Gate Bias Resister	R1I	"	30	0.002	0.001	7.175	4.900	
PMOSFET Gate Bias Resister	R2I	"	30	0.000	0.000	7.400	4.900	
NMOSFET Gate Protection Resister	R3I	"	30	0.003	0.003	7.225	4.325	
PMOSFET	T1I	"	30	0.001	0.001	7.775	5.000	
PMOSFET	T1I2	"	30	0.001	0.001	6.850	5.000	
NMOSFET	T2I	"	30	0.000	0.000	7.775	4.400	
Pico Fuse	F1I	"	100	0.000	0.000	6.475	5.075	
Inductor	I1J	TRICKLE A	~0			8.400	3.475	
Transient Voltage Suppressor	TVS1J	"	~0			7.297	4.050	

Component	Designator	Subcircuit	Duty cycle	Power Dissipation, Bus = 15V (Sunlit)	Power Dissipation, Bus = 12V (Eclipse)	X-Coord	Y-Coord	
Ultra Fast Recovery Diode	UFR1J	"	~0			8.125	3.825	
12v Zener Bi-Directional	D1J	"	~0			7.175	3.150	
PMOSFET Gate Bias Resister	R1J	"	~0			7.175	3.550	
PMOSFET Gate Bias Resister	R2J	"	~0			7.400	3.550	
NMOSFET Gate Protection Resister	R3J	"	~0			7.225	2.975	
PMOSFET	T1J	"	~0			7.775	3.650	
PMOSFET	T1J2	"	~0			6.850	3.650	
NMOSFET	T2J	"	~0			7.775	3.050	
Pico Fuse	F1J	"	~0			6.475	3.725	
Inductor	I1K	TRICKLE B	~0			8.400	2.100	
Transient Voltage Suppressor	TVS1K	"	~0			7.297	2.675	
Ultra Fast Recovery Diode	UFR1K	"	~0			8.125	2.450	
12v Zener Bi-Directional	D1K	"	~0			7.175	1.775	
PMOSFET Gate Bias Resister	R1K	"	~0			7.175	2.175	
PMOSFET Gate Bias Resister	R2K	"	~0			7.400	2.175	
NMOSFET Gate Bias Resister	R3K	"	~0			7.225	1.600	
PMOSFET	T1K	"	~0			7.775	2.275	
PMOSFET	T1K2	"	~0			6.850	2.275	
NMOSFET	T2K	"	~0			7.775	1.675	
Pico Fuse	F1K	"	~0			6.475	2.350	
NMOSFET	T3A	Discharge Battery A				5.750	5.300	
NMOSFET	T3B	Discharge Battery B				5.775	3.650	
LM150	IS1A	Constant Current Source				3.975	3.092	
LM150	IS1B	Constant Current Source				5.225	3.092	
			Total Power	#REF!	0.280W			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APPENDIX K. ITAS THERMAL MASS/DISSIPATIONS

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ÚÄCtrl:CopyÄÄÄÄÄÄÄÄ ITAS Node Data Entry For Thermal Analysis ÄÄÄÄÄÄÄÄESC:QuitÄ¿
³                                                                              ³
³ SEQN   NodeNo   Temp-C   ThrMass  Dissip   Comment                           ³
³    1   901      30       -1.870   0        EPS HOUSING WALL                  ³
³    2   902      30       -.4179   0        EPS HOUSING WALL                  ³
³    3   903      30       -.4179   0        EPS HOUSING WALL                  ³
³    4   904      30       -.4179   0        EPS HOUSING WALL                  ³
³    5   905      30       .4179    0        EPS HOUSING WALL                  ³
³    6   906      30       -10.15   0        BOTTOM EPS HOUSING                ³
³    7   907      30       -1.871   0        EPS HOUSING WALL                  ³
³    8   908      30       -.4179   0        EPS HOUSING WALL                  ³
³    9   909      30       -.4179   0        EPS HOUSING WALL                  ³
³   10   910      30       -.4179   0        EPS HOUSING WALL                  ³
³   11   911      30       -.4179   0        EPS HOUSING WALL                  ³
³   12   912      30       -10.02   0        EPS HOUSING WALL                  ³
³   13   913      30       -6.259   0        EQUIPMENT PLATE TO BOTTOM EPS     ³
³   14   921      30       -.2664   0        BOTTOM RAIL (+Y)                  ³
³   15   922      30       -.3995   0        MIDDLE RAIL (+Y)                  ³
³   16   923      30       -.2120   0        TOP RAIL    (+Y)                  ³
³   17   924      30       -.2664   0        BOTTOM RAIL (-Y)                  ³
³   18   925      30       -.3995   0        MIDDLE RAIL (-Y)                  ³
ÀÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÙ
CTRL-F1Import ITAS_NC   UDC Allowed                          PgDn PgUp Home End
SHFT-F1Import Column                          Shift-F5Del/Pur
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

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³                                                                              ³
³ SEQN   NodeNo   Temp-C   ThrMass  Dissip   Comment                           ³
³   19   926      30       -.2120   0        TOP RAIL (-Y)                     ³
³   20   601      30       -.0043   0        TOP PCB THERMAL LAYER             ³
³   21   602      30       -.0058   0                                          ³
³   22   603      30       -.0016   0                                          ³
³   23   604      30       -.0062   0                                          ³
³   24   605      30       -.0016   0                                          ³
³   25   606      30       -.0085   0                                          ³
³   26   607      30       -.0051   0                                          ³
³   27   608      30       -.0070   0                                          ³
³   28   609      30       -.0019   0                                          ³
³   29   610      30       -.0075   0                                          ³
³   30   611      30       -.0019   0                                          ³
³   31   612      30       -.0103   0                                          ³
³   32   613      30       -.0019   0                                          ³
³   33   614      30       -.0015   0                                          ³
³   34   615      30       -.0015   0                                          ³
³   35   616      30       -.0015   0                                          ³
³   36   617      30       -.0015   0                                          ³
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CTRL-F1Import ITAS_NC   UDC Allowed                          PgDn PgUp Home End
SHFT-F1Import Column                          Shift-F5Del/Pur
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
37	618	30	-.0019	0	TOP PCB THERMAL LAYER
38	619	30	-.0024	0	
39	620	30	-.0019	0	
40	621	30	-.0019	0	
41	622	30	-.0019	0	
42	623	30	-.0019	0	
43	624	30	-.0024	0	
44	625	30	-.0016	0	
45	626	30	-.0016	0	
46	627	30	-.0016	0	
47	628	30	-.0016	0	
48	629	30	-.0016	0	
49	630	30	-.0020	0	
50	1601	30	-.0104	0	BOTTOM PCB THERMAL LAYER
51	1602	30	-.0061	0	BOTTOM PCB THERMAL LAYER
52	1603	30	-.0044	0	BOTTOM PCB THERMAL LAYER
53	1604	30	-.0051	0	BOTTOM PCB THERMAL LAYER
54	1605	30	-.0020	0	BOTTOM PCB THERMAL LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
55	1606	30	-.0098	0	BOTTOM PCB THERMAL LAYER
56	1607	30	-.0031	0	BOTTOM PCB THERMAL LAYER
57	1608	30	-.0022	0	BOTTOM PCB THERMAL LAYER
58	1609	30	-.0028	0	BOTTOM PCB THERMAL LAYER
59	1610	30	-.0007	0	BOTTOM PCB THERMAL LAYER
60	1611	30	-.0010	0	BOTTOM PCB THERMAL LAYER
61	1612	30	-.0010	0	BOTTOM PCB THERMAL LAYER
62	1613	30	-.0049	0	BOTTOM PCB THERMAL LAYER
63	1614	30	-.0071	0	BOTTOM PCB THERMAL LAYER
64	1615	30	-.0111	0	BOTTOM PCB THERMAL LAYER
65	1616	30	-.0137	0	BOTTOM PCB THERMAL LAYER
66	1617	30	-.0046	0	BOTTOM PCB THERMAL LAYER
67	501	30	-.0436	0	TOP PCB BOTTOM POLY LAYER
68	502	30	-.0595	0	TOP PCB BOTTOM POLY LAYER
69	503	30	-.0159	0	TOP PCB BOTTOM POLY LAYER
70	504	30	-.0635	0	TOP PCB BOTTOM POLY LAYER
71	505	30	-.0159	0	TOP PCB BOTTOM POLY LAYER
72	506	30	-0.087	0	TOP PCB BOTTOM POLY LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
73	507	30	-.0528	0	TOP PCB BOTTOM POLY LAYER
74	508	30	-.0720	0	TOP PCB BOTTOM POLY LAYER
75	509	30	-.0192	0	TOP PCB BOTTOM POLY LAYER
76	510	30	-.0768	0	TOP PCB BOTTOM POLY LAYER
77	511	30	-.0192	0	TOP PCB BOTTOM POLY LAYER
78	512	30	-.1056	0	TOP PCB BOTTOM POLY LAYER
79	513	30	-.0190	0	TOP PCB BOTTOM POLY LAYER
80	514	30	-.0149	0	TOP PCB BOTTOM POLY LAYER
81	515	30	-.0149	0	TOP PCB BOTTOM POLY LAYER
82	516	30	-.0149	0	TOP PCB BOTTOM POLY LAYER
83	517	30	-.0149	0	TOP PCB BOTTOM POLY LAYER
84	518	30	-.0190	0	TOP PCB BOTTOM POLY LAYER
85	519	30	-.0248	0	TOP PCB BOTTOM POLY LAYER
86	520	30	-.0195	0	TOP PCB BOTTOM POLY LAYER
87	521	30	-.0195	0	TOP PCB BOTTOM POLY LAYER
88	522	30	-.0195	0	TOP PCB BOTTOM POLY LAYER
89	523	30	-.0195	0	TOP PCB BOTTOM POLY LAYER
90	524	30	-.0248	0	TOP PCB BOTTOM POLY LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
91	525	30	-.0161	0	TOP PCB BOTTOM POLY LAYER
92	526	30	-.0161	0	TOP PCB BOTTOM POLY LAYER
93	527	30	-.0161	0	TOP PCB BOTTOM POLY LAYER
94	528	30	-.0161	0	TOP PCB BOTTOM POLY LAYER
95	529	30	-.0161	0	TOP PCB BOTTOM POLY LAYER
96	530	30	-.0205	0	TOP PCB BOTTOM POLY LAYER
97	1501	30	-.1069	0	BOTTOM PCB BOTTOM POLY LAYER
98	1502	30	-.0627	0	BOTTOM PCB BOTTOM POLY LAYER
99	1503	30	-.0451	0	BOTTOM PCB BOTTOM POLY LAYER
100	1504	30	-.0526	0	BOTTOM PCB BOTTOM POLY LAYER
101	1505	30	-.0200	0	BOTTOM PCB BOTTOM POLY LAYER
102	1506	30	-.1002	0	BOTTOM PCB BOTTOM POLY LAYER
103	1507	30	-.0313	0	BOTTOM PCB BOTTOM POLY LAYER
104	1508	30	-.0226	0	BOTTOM PCB BOTTOM POLY LAYER
105	1509	30	-.0288	0	BOTTOM PCB BOTTOM POLY LAYER
106	1510	30	-.0075	0	BOTTOM PCB BOTTOM POLY LAYER
107	1511	30	-.0100	0	BOTTOM PCB BOTTOM POLY LAYER
108	1512	30	-.0100	0	BOTTOM PCB BOTTOM POLY LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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□                                                                               □
□ SEQN    NodeNo    Temp-C    ThrMass   Dissip    Comment                       □
□  109    1513      30        -.0501    0         BOTTOM PCB BOTTOM POLY LAYER  □
□  110    1514      30        -.0731    0         BOTTOM PCB BOTTOM POLY LAYER  □
□  111    1515      30        -.1140    0         BOTTOM PCB BOTTOM POLY LAYER  □
□  112    1516      30        -.1403    0         BOTTOM PCB BOTTOM POLY LAYER  □
□  113    1517      30        -.0468    0         BOTTOM PCB BOTTOM POLY LAYER  □
□  114    401       30        -.0043    0         TOP PCB THERMAL COPPER LAYER  □
□  115    402       30        -.0058    0         TOP PCB THERMAL COPPER LAYER  □
□  116    403       30        -.0016    0         TOP PCB THERMAL COPPER LAYER  □
□  117    404       30        -.0062    0         TOP PCB THERMAL COPPER LAYER  □
□  118    405       30        -.0016    0         TOP PCB THERMAL COPPER LAYER  □
□  119    406       30        -.0085    0         TOP PCB THERMAL COPPER LAYER  □
□  120    407       30        -.0051    0         TOP PCB THERMAL COPPER LAYER  □
□  121    408       30        -.0071    0         TOP PCB THERMAL COPPER LAYER  □
□  122    409       30        -.0019    0         TOP PCB THERMAL COPPER LAYER  □
□  123    410       30        -.0075    0         TOP PCB THERMAL COPPER LAYER  □
□  124    411       30        -.0019    0         TOP PCB THERMAL COPPER LAYER  □
□  125    412       30        -.0103    0         TOP PCB THERMAL COPPER LAYER  □
□  126    413       30        -.0019    0         TOP PCB THERMAL COPPER LAYER  □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëY
CTRL-F1Import ITAS_NC   UDC Allowed                             PgDn PgUp Home End
SHFT-F1Import Column                        Shift-F5Del/Pur
    F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

```
èëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitët
□                                                                               □
□ SEQN    NodeNo    Temp-C    ThrMass   Dissip    Comment                       □
□  127    414       30        -.0015    0         TOP PCB THERMAL COPPER LAYER  □
□  128    415       30        -.0015    0         TOP PCB THERMAL COPPER LAYER  □
□  129    416       30        -.0015    0         TOP PCB THERMAL COPPER LAYER  □
□  130    417       30        -.0015    0         TOP PCB THERMAL COPPER LAYER  □
□  131    418       30        -.0019    0         TOP PCB THERMAL COPPER LAYER  □
□  132    419       30        -.0024    0         TOP PCB THERMAL COPPER LAYER  □
□  133    420       30        -.0019    0         TOP PCB THERMAL COPPER LAYER  □
□  134    421       30        -.0019    0         TOP PCB THERMAL COPPER LAYER  □
□  135    422       30        -.0019    0         TOP PCB THERMAL COPPER LAYER  □
□  136    423       30        -.0019    0         TOP PCB THERMAL COPPER LAYER  □
□  137    424       30        -.0024    0         TOP PCB THERMAL COPPER LAYER  □
□  138    425       30        -.0016    0         TOP PCB THERMAL COPPER LAYER  □
□  139    426       30        -.0016    0         TOP PCB THERMAL COPPER LAYER  □
□  140    427       30        -.0016    0         TOP PCB THERMAL COPPER LAYER  □
□  141    428       30        -.0016    0         TOP PCB THERMAL COPPER LAYER  □
□  142    429       30        -.0016    0         TOP PCB THERMAL COPPER LAYER  □
□  143    430       30        -.0020    0         TOP PCB THERMAL COPPER LAYER  □
□  144    1401      30        -.0104    0         BOTTOM PCB GROUND (COPPER) LAYER □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëY
CTRL-F1Import ITAS_NC   UDC Allowed                             PgDn PgUp Home End
SHFT-F1Import Column                        Shift-F5Del/Pur
    F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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ÈËCtrl:CopyËËËËËËË ITAS Node Data Entry For Thermal Analysis ËËËËËËËESC:QuitËÉ
º                                                                              º
º SEQN   NodeNo   Temp-C   ThrMass  Dissip   Comment                           º
º  145    1402      30       -.0061   0       BOTTOM PCB GROUND (COPPER) LAYER  º
º  146    1403      30       -.0044   0       BOTTOM PCB GROUND (COPPER) LAYER  º
º  147    1404      30       -.0051   0       BOTTOM PCB GROUND (COPPER) LAYER  º
º  148    1405      30       -.0020   0       BOTTOM PCB GROUND (COPPER) LAYER  º
º  149    1406      30       -.0098   0       BOTTOM PCB GROUND (COPPER) LAYER  º
º  150    1407      30       -.0031   0       BOTTOM PCB GROUND (COPPER) LAYER  º
º  151    1408      30       -.0022   0       BOTTOM PCB GROUND (COPPER) LAYER  º
º  152    1409      30       -.0028   0       BOTTOM PCB GROUND (COPPER) LAYER  º
º  153    1410      30       -.0007   0       BOTTOM PCB GROUND (COPPER) LAYER  º
º  154    1411      30       -.0010   0       BOTTOM PCB GROUND (COPPER) LAYER  º
º  155    1412      30       -.0010   0       BOTTOM PCB GROUND (COPPER) LAYER  º
º  156    1413      30       -.0049   0       BOTTOM PCB GROUND (COPPER) LAYER  º
º  157    1414      30       -.0071   0       BOTTOM PCB GROUND (COPPER) LAYER  º
º  158    1415      30       -.0111   0       BOTTOM PCB GROUND (COPPER) LAYER  º
º  159    1416      30       -.0137   0       BOTTOM PCB GROUND (COPPER) LAYER  º
º  160    1417      30       -.0046   0       BOTTOM PCB GROUND (COPPER) LAYER  º
º  161    301       30       -.0436   0       TOP PCB MIDDLE POLY LAYER         º
º  162    302       30       -.0595   0       TOP PCB MIDDLE POLY LAYER         º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÍ
CTRL-F1Import ITAS_NC   UDC Allowed                        PgDn PgUp Home End
SHFT-F1Import Column                          Shift-F5Del/Pur
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ÈËCtrl:CopyËËËËËËË ITAS Node Data Entry For Thermal Analysis ËËËËËËËESC:QuitËÉ
º                                                                              º
º SEQN   NodeNo   Temp-C   ThrMass  Dissip   Comment                           º
º  163    303       30       -.0159   0       TOP PCB MIDDLE POLY LAYER         º
º  164    304       30       -.0635   0       TOP PCB MIDDLE POLY LAYER         º
º  165    305       30       -.0159   0       TOP PCB MIDDLE POLY LAYER         º
º  166    306       30       -.0873   0       TOP PCB MIDDLE POLY LAYER         º
º  167    307       30       -.0528   0       TOP PCB MIDDLE POLY LAYER         º
º  168    308       30       -.0720   0       TOP PCB MIDDLE POLY LAYER         º
º  169    309       30       -.0192   0       TOP PCB MIDDLE POLY LAYER         º
º  170    310       30       -.0768   0       TOP PCB MIDDLE POLY LAYER         º
º  171    311       30       -.0192   0       TOP PCB MIDDLE POLY LAYER         º
º  172    312       30       -.1056   0       TOP PCB MIDDLE POLY LAYER         º
º  173    313       30       -.0190   0       TOP PCB MIDDLE POLY LAYER         º
º  174    314       30       -.0149   0       TOP PCB MIDDLE POLY LAYER         º
º  175    315       30       -.0149   0       TOP PCB MIDDLE POLY LAYER         º
º  176    316       30       -.0149   0       TOP PCB MIDDLE POLY LAYER         º
º  177    317       30       -.0149   0       TOP PCB MIDDLE POLY LAYER         º
º  178    318       30       -.0190   0       TOP PCB MIDDLE POLY LAYER         º
º  179    319       30       -.0248   0       TOP PCB MIDDLE POLY LAYER         º
º  180    320       30       -.0195   0       TOP PCB MIDDLE POLY LAYER         º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÍ
CTRL-F1Import ITAS_NC   UDC Allowed                        PgDn PgUp Home End
SHFT-F1Import Column                          Shift-F5Del/Pur
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

```
ëëCtrl:Copyëëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitë£
□                                                                             □
□ SEQN    NodeNo    Temp-C    ThrMass   Dissip    Comment                     □
□  181    321       30        -.0195    0         TOP PCB MIDDLE POLY LAYER   □
□  182    322       30        -.0195    0         TOP PCB MIDDLE POLY LAYER   □
□  183    323       30        -.0195    0         TOP PCB MIDDLE POLY LAYER   □
□  184    324       30        -.0248    0         TOP PCB MIDDLE POLY LAYER   □
□  185    325       30        -.0161    0         TOP PCB MIDDLE POLY LAYER   □
□  186    326       30        -.0161    0         TOP PCB MIDDLE POLY LAYER   □
□  187    327       30        -.0161    0         TOP PCB MIDDLE POLY LAYER   □
□  188    328       30        -.0161    0         TOP PCB MIDDLE POLY LAYER   □
□  189    329       30        -.0161    0         TOP PCB MIDDLE POLY LAYER   □
□  190    330       30        -.0205    0         TOP PCB MIDDLE POLY LAYER   □
□  191    1301      30        -.1069    0         BOTTOM PCB MIDDLE POLY LAYER □
□  192    1302      30        -.0627    0         BOTTOM PCB MIDDLE POLY LAYER □
□  193    1303      30        -.0451    0         BOTTOM PCB MIDDLE POLY LAYER □
□  194    1304      30        -.0526    0         BOTTOM PCB MIDDLE POLY LAYER □
□  195    1305      30        -.0200    0         BOTTOM PCB MIDDLE POLY LAYER □
□  196    1306      30        -.1000    0         BOTTOM PCB MIDDLE POLY LAYER □
□  197    1307      30        -.0313    0         BOTTOM PCB MIDDLE POLY LAYER □
□  198    1308      30        -.0226    0         BOTTOM PCB MIDDLE POLY LAYER □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC   UDC Allowed                      PgDn PgUp Home End
SHFT-F1Import Column                     Shift-F5Del/Pur
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

```
ëëCtrl:Copyëëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitë£
□                                                                             □
□ SEQN    NodeNo    Temp-C    ThrMass   Dissip    Comment                     □
□  199    1309      30        -.0288    0         BOTTOM PCB MIDDLE POLY LAYER □
□  200    1310      30        -.0075    0         BOTTOM PCB MIDDLE POLY LAYER □
□  201    1311      30        -.0100    0         BOTTOM PCB MIDDLE POLY LAYER □
□  202    1312      30        -.0100    0         BOTTOM PCB MIDDLE POLY LAYER □
□  203    1313      30        -.0501    0         BOTTOM PCB MIDDLE POLY LAYER □
□  204    1314      30        -.0731    0         BOTTOM PCB MIDDLE POLY LAYER □
□  205    1315      30        -.1140    0         BOTTOM PCB MIDDLE POLY LAYER □
□  206    1316      30        -.1403    0         BOTTOM PCB MIDDLE POLY LAYER □
□  207    1317      30        -.0468    0         BOTTOM PCB MIDDLE POLY LAYER □
□  208    201       30        -.0043    0         TOP PCB TOP COPPER LAYER    □
□  209    202       30        -.0058    0         TOP PCB TOP COPPER LAYER    □
□  210    203       30        -.0016    0         TOP PCB TOP COPPER LAYER    □
□  211    204       30        -.0062    0         TOP PCB TOP COPPER LAYER    □
□  212    205       30        -.0016    0         TOP PCB TOP COPPER LAYER    □
□  213    206       30        -.0085    0         TOP PCB TOP COPPER LAYER    □
□  214    207       30        -.0051    0         TOP PCB TOP COPPER LAYER    □
□  215    208       30        -.0070    0         TOP PCB TOP COPPER LAYER    □
□  216    209       30        -.0019    0         TOP PCB TOP COPPER LAYER    □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC   UDC Allowed                      PgDn PgUp Home End
SHFT-F1Import Column                     Shift-F5Del/Pur
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

ëëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitëë

SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
217	210	30	-.0075	0	TOP PCB TOP COPPER LAYER
218	211	30	-.0019	0	TOP PCB TOP COPPER LAYER
219	212	30	-.0103	0	TOP PCB TOP COPPER LAYER
220	213	30	-.0019	0	TOP PCB TOP COPPER LAYER
221	214	30	-.0015	0	TOP PCB TOP COPPER LAYER
222	215	30	-.0015	0	TOP PCB TOP COPPER LAYER
223	216	30	-.0015	0	TOP PCB TOP COPPER LAYER
224	217	30	-.0015	0	TOP PCB TOP COPPER LAYER
225	218	30	-.0187	0	TOP PCB TOP COPPER LAYER
226	219	30	-.0024	0	TOP PCB TOP COPPER LAYER
227	220	30	-.0019	0	TOP PCB TOP COPPER LAYER
228	221	30	-.0019	0	TOP PCB TOP COPPER LAYER
229	222	30	-.0019	0	TOP PCB TOP COPPER LAYER
230	223	30	-.0019	0	TOP PCB TOP COPPER LAYER
231	224	30	-.0024	0	TOP PCB TOP COPPER LAYER
232	225	30	-.0016	0	TOP PCB TOP COPPER LAYER
233	226	30	-.0016	0	TOP PCB TOP COPPER LAYER
234	227	30	-.0016	0	TOP PCB TOP COPPER LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

ëëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitëë

SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
235	228	30	-.0016	0	TOP PCB TOP COPPER LAYER
236	229	30	-.0016	0	TOP PCB TOP COPPER LAYER
237	230	30	-.0020	0	TOP PCB TOP COPPER LAYER
238	1201	30	-.0104	0	BOTTOM PCB TOP COPPER LAYER
239	1202	30	-.0061	0	BOTTOM PCB TOP COPPER LAYER
240	1203	30	-.0044	0	BOTTOM PCB TOP COPPER LAYER
241	1204	30	-.0051	0	BOTTOM PCB TOP COPPER LAYER
242	1205	30	-.0020	0	BOTTOM PCB TOP COPPER LAYER
243	1206	30	-.0098	0	BOTTOM PCB TOP COPPER LAYER
244	1207	30	-.0031	0	BOTTOM PCB TOP COPPER LAYER
245	1208	30	-.0022	0	BOTTOM PCB TOP COPPER LAYER
246	1209	30	-.0028	0	BOTTOM PCB TOP COPPER LAYER
247	1210	30	-.0007	0	BOTTOM PCB TOP COPPER LAYER
248	1211	30	-.0010	0	BOTTOM PCB TOP COPPER LAYER
249	1212	30	-.0010	0	BOTTOM PCB TOP COPPER LAYER
250	1213	30	-.0049	0	BOTTOM PCB TOP COPPER LAYER
251	1214	30	-.0071	0	BOTTOM PCB TOP COPPER LAYER
252	1215	30	-.0111	0	BOTTOM PCB TOP COPPER LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

èëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitë£

SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
253	1216	30	-.0137	0	BOTTOM PCB TOP COPPER LAYER
254	1217	30	-.0046	0	BOTTOM PCB TOP COPPER LAYER
255	101	30	-.0436	0	TOP PCB TOP POLY LAYER
256	102	30	-.0595	0	TOP PCB TOP POLY LAYER
257	103	30	-.0159	0	TOP PCB TOP POLY LAYER
258	104	30	-.0635	0	TOP PCB TOP POLY LAYER
259	105	30	-.0159	0	TOP PCB TOP POLY LAYER
260	106	30	-.0873	0	TOP PCB TOP POLY LAYER
261	107	30	-.0528	0	TOP PCB TOP POLY LAYER
262	108	30	-.0720	0	TOP PCB TOP POLY LAYER
263	109	30	-.0192	0	TOP PCB TOP POLY LAYER
264	110	30	-.0768	0	TOP PCB TOP POLY LAYER
265	111	30	-.0192	0	TOP PCB TOP POLY LAYER
266	112	30	-.1056	0	TOP PCB TOP POLY LAYER
267	113	30	-.0190	0	TOP PCB TOP POLY LAYER
268	114	30	-.0149	0	TOP PCB TOP POLY LAYER
269	115	30	-.0149	0	TOP PCB TOP POLY LAYER
270	116	30	-.0149	0	TOP PCB TOP POLY LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

èëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitë£

SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
271	117	30	-.0149	0	TOP PCB TOP POLY LAYER
272	118	30	-.0190	0	TOP PCB TOP POLY LAYER
273	119	30	-.0248	0	TOP PCB TOP POLY LAYER
274	120	30	-.0195	0	TOP PCB TOP POLY LAYER
275	121	30	-.0195	0	TOP PCB TOP POLY LAYER
276	122	30	-.0195	0	TOP PCB TOP POLY LAYER
277	123	30	-.0195	0	TOP PCB TOP POLY LAYER
278	124	30	-.0248	0	TOP PCB TOP POLY LAYER
279	125	30	-.0161	0	TOP PCB TOP POLY LAYER
280	126	30	-.0161	0	TOP PCB TOP POLY LAYER
281	127	30	-.0161	0	TOP PCB TOP POLY LAYER
282	128	30	-.0161	0	TOP PCB TOP POLY LAYER
283	129	30	-.0161	0	TOP PCB TOP POLY LAYER
284	130	30	-.0205	0	TOP PCB TOP POLY LAYER
285	1101	30	-.1069	0	BOTTOM PCB TOP POLY LAYER
286	1102	30	-.0627	0	BOTTOM PCB TOP POLY LAYER
287	1103	30	-.0451	0	BOTTOM PCB TOP POLY LAYER
288	1104	30	-.0526	0	BOTTOM PCB TOP POLY LAYER

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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èëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëESC:Quitë£
□                                                                              □
□ SEQN    NodeNo   Temp-C   ThrMass   Dissip   Comment                         □
□  289    1105     30       -.0200    0        BOTTOM PCB TOP POLY LAYER       □
□  290    1106     30       -.1000    0        BOTTOM PCB TOP POLY LAYER       □
□  291    1107     30       -.0313    0        BOTTOM PCB TOP POLY LAYER       □
□  292    1108     30       -.0226    0        BOTTOM PCB TOP POLY LAYER       □
□  293    1109     30       -.0288    0        BOTTOM PCB TOP POLY LAYER       □
□  294    1110     30       -.0075    0        BOTTOM PCB TOP POLY LAYER       □
□  295    1111     30       -.0100    0        BOTTOM PCB TOP POLY LAYER       □
□  296    1112     30       -.0100    0        BOTTOM PCB TOP POLY LAYER       □
□  297    1113     30       -.0501    0        BOTTOM PCB TOP POLY LAYER       □
□  298    1114     30       -.0731    0        BOTTOM PCB TOP POLY LAYER       □
□  299    1115     30       -.1140    0        BOTTOM PCB TOP POLY LAYER       □
□  300    1116     30       -.1403    0        BOTTOM PCB TOP POLY LAYER       □
□  301    1117     30       -.0468    0        BOTTOM PCB TOP POLY LAYER       □
□  302    2011     30       -.0001    .039     PIN THROUGH NODE 3.01           □
□  303    2012     30       -.0001    0        PIN THROUGH NODE 3.01           □
□  304    2013     30       -.0001    0        PIN THROUGH NODE 3.01           □
□  305    2014     30       -.0001    0        PIN THROUGH NODE 3.01           □
□  306    2015     30       -.0001    0        PIN THROUGH NODE 3.01           □
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CTRL-F1Import ITAS_NC   UDC Allowed                       PgDn PgUp Home End
SHFT-F1Import Column                          Shift-F5Del/Pur
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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èëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëESC:Quitë£
□                                                                              □
□ SEQN    NodeNo   Temp-C   ThrMass   Dissip   Comment                         □
□  307    2016     30       -.0001    0        PIN THROUGH NODE 3.01           □
□  308    2021     30       -.0004    .018     PIN THROUGH 3.02 POLY LAYERS    □
□  309    2023     30       -.0004    0        PIN THROUGH 3.02 POLY LAYERS    □
□  310    2025     30       -.0004    0        PIN THROUGH 3.02 POLY LAYERS    □
□  311    2022     30       -.0001    0        PIN THROUGH 3.02 COPPER LAYERS  □
□  312    2024     30       -.0001    0        PIN THROUGH 3.02 COPPER LAYERS  □
□  313    2026     30       -.0001    0        PIN THROUGH 3.02 COPPER LAYERS  □
□  314    2031     30       -.0001    .039     PIN THROUGH 3.03 POLY LAYERS    □
□  315    2033     30       -.0001    0        PIN THROUGH 3.03 POLY LAYERS    □
□  316    2035     30       -.0001    0        PIN THROUGH 3.03 POLY LAYERS    □
□  317    2032     30       -.0001    0        PIN THROUGH 3.03 COPPER LAYERS  □
□  318    2034     30       -.0001    0        PIN THROUGH 3.03 COPPER LAYERS  □
□  319    2036     30       -.0001    0        PIN THROUGH 3.03 COPPER LAYERS  □
□  320    2041     30       -.0004    .018     PIN THROUGH 3.04 POLY LAYERS    □
□  321    2043     30       -.0004    0        PIN THROUGH 3.04 POLY LAYERS    □
□  322    2045     30       -.0004    0        PIN THROUGH 3.04 POLY LAYERS    □
□  323    2042     30       -.0001    0        PIN THROUGH 3.04 COPPER LAYERS  □
□  324    2044     30       -.0001    0        PIN THROUGH 3.04 COPPER LAYERS  □
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CTRL-F1Import ITAS_NC   UDC Allowed                       PgDn PgUp Home End
SHFT-F1Import Column                          Shift-F5Del/Pur
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
325	2046	30	-.0001	0	PIN THROUGH 3.04 COPPER LAYERS
326	2051	30	-.0001	.088	PIN THROUGH 3.05 POLY LAYERS
327	2053	30	-.0001	0	PIN THROUGH 3.05 POLY LAYERS
328	2055	30	-.0001	0	PIN THROUGH 3.05 POLY LAYERS
329	2061	30	-.0004	.035	PIN THROUGH 3.06 POLY LAYERS
330	2063	30	-.0004	0	PIN THROUGH 3.06 POLY LAYERS
331	2065	30	-.0004	0	PIN THROUGH 3.06 POLY LAYERS
332	2052	30	-.0001	0	PIN THROUGH 3.05 COPPER LAYERS
333	2054	30	-.0001	0	PIN THROUGH 3.05 COPPER LAYERS
334	2062	30	-.0001	0	PIN THROUGH 3.06 COPPER LAYER
335	2064	30	-.0001	0	PIN THROUGH 3.06 COPPER LAYER
336	2066	30	-.0001	0	PIN THROUGH 3.06 COPPER LAYER
337	2071	30	-.0001	.012	PIN THROUGH 3.07 POLY LAYERS
338	2073	30	-.0001	0	PIN THROUGH 3.07 POLY LAYERS
339	2075	30	-.0001	0	PIN THROUGH 3.07 POLY LAYERS
340	2072	30	-.0001	0	PIN THROUGH 3.07 COPPER LAYERS
341	2074	30	-.0001	0	PIN THROUGH 3.07 COPPER LAYERS
342	2076	30	-.0001	0	PIN THROUGH 3.07 COPPER LAYERS

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
343	2081	30	-.0004	.015	PIN THROUGH 3.08 POLY LAYERS
344	2083	30	-.0004	0	PIN THROUGH 3.08 POLY LAYERS
345	2085	30	-.0004	0	PIN THROUGH 3.08 POLY LAYERS
346	2082	30	-.0001	0	PIN THROUGH 3.08 COPPER LAYERS
347	2084	30	-.0001	0	PIN THROUGH 3.08 COPPER LAYERS
348	2086	30	-.0001	0	PIN THROUGH 3.08 COPPER LAYERS
349	2091	30	-.0001	.05	PIN THROUGH 3.09 POLY LAYERS
350	2093	30	-.0001	0	PIN THROUGH 3.09 POLY LAYERS
351	2095	30	-.0001	0	PIN THROUGH 3.09 POLY LAYERS
352	2092	30	-.0001	0	PIN THROUGH 3.09 COPPER LAYERS
353	2094	30	-.0001	0	PIN THROUGH 3.09 COPPER LAYERS
354	2096	30	-.0001	0	PIN THROUGH 3.09 COPPER LAYERS
355	2101	30	-.0004	.015	PIN THROUGH 3.10 POLY LAYERS
356	2103	30	-.0004	0	PIN THROUGH 3.10 POLY LAYERS
357	2105	30	-.0004	0	PIN THROUGH 3.10 POLY LAYERS
358	2102	30	-.0001	0	PIN THROUGH 3.10 COPPER LAYERS
359	2104	30	-.0001	0	PIN THROUGH 3.10 COPPER LAYERS
360	2106	30	-.0001	0	PIN THROUGH 3.10 COPPER LAYERS

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
361	2111	30	-.0001	0	PIN THROUGH 3.11 POLY LAYERS
362	2113	30	-.0001	0	PIN THROUGH 3.11 POLY LAYERS
363	2115	30	-.0001	0	PIN THROUGH 3.11 POLY LAYERS
364	2112	30	-.0001	0	PIN THROUGH 3.12 COPPER LAYERS
365	2114	30	-.0001	0	PIN THROUGH 3.12 COPPER LAYERS
366	2116	30	-.0001	0	PIN THROUGH 3.12 COPPER LAYERS
367	2121	30	-.0002	0	PIN THROUGH 3.12 POLY LAYER
368	2123	30	-.0002	0	PIN THROUGH 3.12 POLY LAYER
369	2125	30	-.0002	0	PIN THROUGH 3.12 POLY LAYER
370	2122	30	-.0001	0	PIN THROUGH 3.12 COPPER LAYERS
371	2131	30	-.0001	.004	PIN THROUGH 2.01 POLY LAYER
372	2133	30	-.0001	0	PIN THROUGH 2.01 POLY LAYER
373	2135	30	-.0001	0	PIN THROUGH 2.01 POLY LAYER
374	2132	30	-.0001	0	PIN THROUGH 2.01 COPPER LAYERS
375	2134	30	-.0001	0	PIN THROUGH 2.01 COPPER LAYERS
376	2136	30	-.0001	0	PIN THROUGH 2.01 COPPER LAYERS
377	2141	30	-.0001	.004	PIN THROUGH 2.02 POLY LAYERS
378	2143	30	-.0001	0	PIN THROUGH 2.02 POLY LAYERS

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
379	2145	30	-.0001	0	PIN THROUGH 2.02 POLY LAYERS
380	2142	30	-.0001	0	PIN THROUGH 2.02 COPPER LAYERS
381	2144	30	-.0001	0	PIN THROUGH 2.02 COPPER LAYERS
382	2146	30	-.0001	0	PIN THROUGH 2.02 COPPER LAYERS
383	2151	30	-.0001	.001	PIN THROUGH 2.03 POLY LAYER
384	2153	30	-.0001	0	PIN THROUGH 2.03 POLY LAYER
385	2155	30	-.0001	0	PIN THROUGH 2.03 POLY LAYER
386	2152	30	-.0001	0	PIN THROUGH 2.03 COPPER LAYERS
387	2154	30	-.0001	0	PIN THROUGH 2.03 COPPER LAYERS
388	2156	30	-.0001	0	PIN THROUGH 2.03 COPPER LAYERS
389	2161	30	-.0001	.001	PIN THROUGH 2.04 POLY LAYER
390	2163	30	-.0001	0	PIN THROUGH 2.04 POLY LAYER
391	2165	30	-.0001	0	PIN THROUGH 2.04 POLY LAYER
392	2162	30	-.0001	0	PIN THROUGH 2.04 COPPER LAYERS
393	2164	30	-.0001	0	PIN THROUGH 2.04 COPPER LAYERS
394	2166	30	-.0001	0	PIN THROUGH 2.04 COPPER LAYERS
395	2171	30	-.0001	0	PIN THROUGH 2.05 POLY LAYERS
396	2173	30	-.0001	0	PIN THROUGH 2.05 POLY LAYERS

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
397	2175	30	-.0001	0	PIN THROUGH 2.05 POLY LAYERS
398	2172	30	-.0001	0	PIN THROUGH 2.05 COPPER LAYERS
399	2174	30	-.0001	0	PIN THROUGH 2.05 COPPER LAYERS
400	2176	30	-.0001	0	PIN THROUGH 2.05 COPPER LAYERS
401	2181	30	-.0001	0	PIN THROUGH 2.06 POLY LAYERS
402	2183	30	-.0001	0	PIN THROUGH 2.06 POLY LAYERS
403	2185	30	-.0001	0	PIN THROUGH 2.06 POLY LAYERS
404	2182	30	-.0001	0	PIN THROUGH 2.06 COPPER LAYERS
405	2184	30	-.0001	0	PIN THROUGH 2.06 COPPER LAYERS
406	2186	30	-.0001	0	PIN THROUGH 2.06 COPPER LAYERS
407	2191	30	-.0003	.008	PIN THROUGH 2.07 POLY LAYERS
408	2193	30	-.0003	0	PIN THROUGH 2.07 POLY LAYERS
409	2195	30	-.0003	0	PIN THROUGH 2.07 POLY LAYERS
410	2192	30	-.0001	0	PIN THROUGH 2.07 COPPER LAYERS
411	2194	30	-.0001	0	PIN THROUGH 2.07 COPPER LAYERS
412	2196	30	-.0001	0	PIN THROUGH 2.07 COPPER LAYERS
413	2201	30	-.0003	.008	PIN THROUGH 2.08 POLY LAYERS
414	2203	30	-.0003	0	PIN THROUGH 2.08 POLY LAYERS

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

Ctrl:Copy ITAS Node Data Entry For Thermal Analysis ESC:Quit

SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
415	2205	30	-.0003	0	PIN THROUGH 2.08 POLY LAYERS
416	2202	30	-.0001	0	PIN THROUGH 2.08 COPPER LAYERS
417	2204	30	-.0001	0	PIN THROUGH 2.08 COPPER LAYERS
418	2206	30	-.0001	0	PIN THROUGH 2.08 COPPER LAYERS
419	2211	30	-.0003	.003	PIN THROUGH 2.09 POLY LAYERS
420	2213	30	-.0003	0	PIN THROUGH 2.09 POLY LAYERS
421	2215	30	-.0003	0	PIN THROUGH 2.09 POLY LAYERS
422	2212	30	-.0001	0	PIN THROUGH 2.09 COPPER LAYERS
423	2214	30	-.0001	0	PIN THROUGH 2.09 COPPER LAYERS
424	2216	30	-.0001	0	PIN THROUGH 2.09 COPPER LAYERS
425	2221	30	-.0003	.006	PIN THROUGH 2.10 POLY LAYERS
426	2223	30	-.0003	0	PIN THROUGH 2.10 POLY LAYERS
427	2225	30	-.0003	0	PIN THROUGH 2.10 POLY LAYERS
428	2222	30	-.0001	0	PIN THROUGH 2.10 COPPER LAYERS
429	2224	30	-.0001	0	PIN THROUGH 2.10 COPPER LAYERS
430	2226	30	-.0001	0	PIN THROUGH 2.10 COPPER LAYERS
431	2231	30	-.0003	0	PIN THROUGH 2.11 POLY LAYERS
432	2233	30	-.0003	0	PIN THROUGH 2.11 POLY LAYERS

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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èëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitë£
□                                                                              □
□ SEQN    NodeNo    Temp-C    ThrMass    Dissip    Comment                     □
□  433    2235      30        -.0003     0         PIN THROUGH 2.11 POLY LAYERS      □
□  434    2232      30        -.0001     0         PIN THROUGH 2.11 COPPER LAYERS    □
□  435    2234      30        -.0001     0         PIN THROUGH 2.11 COPPER LAYERS    □
□  436    2236      30        -.0001     0         PIN THROUGH 2.11 COPPER LAYERS    □
□  437    2241      30        -.0003     0         PIN THROUGH 2.12 POLY LAYER       □
□  438    2243      30        -.0003     0         PIN THROUGH 2.12 POLY LAYER       □
□  439    2245      30        -.0003     0         PIN THROUGH 2.12 POLY LAYER       □
□  440    2242      30        -.0001     0         PIN THROUGH 2.12 COPPER LAYERS    □
□  441    2244      30        -.0001     0         PIN THROUGH 2.12 COPPER LAYERS    □
□  442    2246      30        -.0001     0         PIN THROUGH 2.12 COPPER LAYERS    □
□  443    2251      30        -.0001     .006      PIN THROUGH 2.13 POLY LAYERS      □
□  444    2253      30        -.0001     0         PIN THROUGH 2.13 POLY LAYERS      □
□  445    2255      30        -.0001     0         PIN THROUGH 2.13 POLY LAYERS      □
□  446    2252      30        -.0001     0         PIN THROUGH 2.13 COPPER LAYERS    □
□  447    2254      30        -.0001     0         PIN THROUGH 2.13 COPPER LAYERS    □
□  448    2256      30        -.0001     0         PIN THROUGH 2.13 COPPER LAYERS    □
□  449    2261      30        -.0001     .006      PIN THROUGH 2.14 POLY LAYERS      □
□  450    2263      30        -.0001     0         PIN THROUGH 2.14 POLY LAYERS      □
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CTRL-F1Import ITAS_NC   UDC Allowed                        PgDn PgUp Home End
SHFT-F1Import Column                       Shift-F5Del/Pur
    F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

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□                                                                              □
□ SEQN    NodeNo    Temp-C    ThrMass    Dissip    Comment                     □
□  451    2265      30        -.0001     0         PIN THROUGH 2.14 POLY LAYERS      □
□  452    2262      30        -.0001     0         PIN THROUGH 2.14 COPPER LAYERS    □
□  453    2264      30        -.0001     0         PIN THROUGH 2.14 COPPER LAYERS    □
□  454    2266      30        -.0001     0         PIN THROUGH 2.14 COPPER LAYERS    □
□  455    2271      30        -.0001     .001      PIN THROUGH 2.15 POLY LAYERS      □
□  456    2273      30        -.0001     0         PIN THROUGH 2.15 POLY LAYERS      □
□  457    2275      30        -.0001     0         PIN THROUGH 2.15 POLY LAYERS      □
□  458    2272      30        -.0001     0         PIN THROUGH 2.15 COPPER LAYERS    □
□  459    2274      30        -.0001     0         PIN THROUGH 2.15 COPPER LAYERS    □
□  460    2276      30        -.0001     0         PIN THROUGH 2.15 COPPER LAYERS    □
□  461    2281      30        -.0001     .001      PIN THROUGH 2.16 POLY LAYERS      □
□  462    2283      30        -.0001     0         PIN THROUGH 2.16 POLY LAYERS      □
□  463    2285      30        -.0001     0         PIN THROUGH 2.16 POLY LAYERS      □
□  464    2282      30        -.0001     0         PIN THROUGH 2.16 COPPER LAYERS    □
□  465    2284      30        -.0001     0         PIN THROUGH 2.16 COPPER LAYERS    □
□  466    2286      30        -.0001     0         PIN THROUGH 2.16 COPPER LAYERS    □
□  467    2291      30        -.0001     0         PIN THROUGH 2.17 POLY LAYERS      □
□  468    2293      30        -.0001     0         PIN THROUGH 2.17 POLY LAYERS      □
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CTRL-F1Import ITAS_NC   UDC Allowed                        PgDn PgUp Home End
SHFT-F1Import Column                       Shift-F5Del/Pur
    F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
469	2295	30	-.0001	0	PIN THROUGH 2.17 POLY LAYERS
470	2292	30	-.0001	0	PIN THROUGH 2.17 COPPER LAYERS
471	2294	30	-.0001	0	PIN THROUGH 2.17 COPPER LAYERS
472	2296	30	-.0001	0	PIN THROUGH 2.17 COPPER LAYERS
473	2301	30	-.0001	0	PIN THROUGH 2.18 POLY LAYERS
474	2303	30	-.0001	0	PIN THROUGH 2.18 POLY LAYERS
475	2305	30	-.0001	0	PIN THROUGH 2.18 POLY LAYERS
476	2302	30	-.0001	0	PIN THROUGH 2.18 COPPER LAYERS
477	2304	30	-.0001	0	PIN THROUGH 2.18 COPPER LAYERS
478	2306	30	-.0001	0	PIN THROUGH 2.18 COPPER LAYERS
479	3011	30	-.0011	0	PIN THROUGH 4.00 POLY LAYERS
480	3013	30	-.0011	0	PIN THROUGH 4.00 POLY LAYERS
481	3015	30	-.0011	0	PIN THROUGH 4.00 POLY LAYERS
482	3012	30	-.0001	0	PIN THROUGH 4.00 COPPER LAYERS
483	3014	30	-.0001	0	PIN THROUGH 4.00 COPPER LAYERS
484	3016	30	-.0001	0	PIN THROUGH 4.00 COPPER LAYERS
485	3021	30	-.0006	.113	PIN THROUGH 5.01 POLY LAYERS
486	3023	30	-.0006	0	PIN THROUGH 5.01 POLY LAYERS

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
487	3025	30	-.0006	0	PIN THROUGH 5.01 POLY LAYERS
488	3022	30	-.0001	0	PIN THROUGH 5.01 COPPER LAYERS
489	3024	30	-.0001	0	PIN THROUGH 5.01 COPPER LAYERS
490	3026	30	-.0001	0	PIN THROUGH 5.01 COPPER LAYERS
491	3031	30	-.0006	.036	PIN THROUGH 5.02 POLY LAYERS
492	3033	30	-.0006	0	PIN THROUGH 5.02 POLY LAYERS
493	3035	30	-.0006	0	PIN THROUGH 5.02 POLY LAYERS
494	3032	30	-.0001	0	PIN THROUGH 5.02 COPPER LAYERS
495	3034	30	-.0001	0	PIN THROUGH 5.02 COPPER LAYERS
496	3036	30	-.0001	0	PIN THROUGH 5.02 COPPER LAYERS
497	3041	30	-.0002	0	PIN THROUGH 5.03 POLY LAYERS
498	3043	30	-.0002	0	PIN THROUGH 5.03 POLY LAYERS
499	3045	30	-.0002	0	PIN THROUGH 5.03 POLY LAYERS
500	3042	30	-.0001	0	PIN THROUGH 5.03 COPPER LAYERS
501	3044	30	-.0001	0	PIN THROUGH 5.03 COPPER LAYERS
502	3046	30	-.0001	0	PIN THROUGH 5.03 COPPER LAYERS
503	3051	30	-.0005	.05	PIN THROUGH 5.04 POLY LAYERS
504	3053	30	-.0005	0	PIN THROUGH 5.04 POLY LAYERS

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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ëëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitëë
□                                                                              □
□ SEQN    NodeNo    Temp-C    ThrMass    Dissip    Comment                     □
□  505    3055      30        -.0005     0         PIN THROUGH 5.04 POLY LAYERS       □
□  506    3052      30        -.0001     0         PIN THROUGH 5.04 COPPER LAYERS     □
□  507    3054      30        -.0001     0         PIN THROUGH 5.04 COPPER LAYERS     □
□  508    3056      30        -.0001     0         PIN THROUGH 5.04 COPPER LAYERS     □
□  509    3061      30        -.0006     .025      PIN THROUGH 5.05 POLY LAYERS       □
□  510    3063      30        -.0006     0         PIN THROUGH 5.05 POLY LAYERS       □
□  511    3065      30        -.0006     0         PIN THROUGH 5.05 POLY LAYERS       □
□  512    3062      30        -.0006     0         PIN THROUGH 5.05 COPPER LAYERS     □
□  513    3064      30        -.0001     0         PIN THROUGH 5.05 COPPER LAYERS     □
□  514    3066      30        -.0001     0         PIN THROUGH 5.05 COPPER LAYERS     □
□  515    3091      30        -.0001     .1        PIN THROUGH 6.03 POLY LAYERS       □
□  516    3093      30        -.0001     0         PIN THROUGH 6.03 POLY LAYERS       □
□  517    3095      30        -.0001     0         PIN THROUGH 6.03 POLY LAYERS       □
□  518    3092      30        -.0001     0         PIN THROUGH 6.03 COPPER LAYERS     □
□  519    3094      30        -.0001     0         PIN THROUGH 6.03 COPPER LAYERS     □
□  520    3096      30        -.0001     0         PIN THROUGH 6.03 COPPER LAYERS     □
□  521    3101      30        -.0001     .125      PIN THROUGH 6.04 POLY LAYERS       □
□  522    3103      30        -.0001     0         PIN THROUGH 6.04 POLY LAYERS       □
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CTRL-F1Import ITAS_NC    UDC Allowed                         PgDn PgUp Home End
SHFT-F1Import Column                     Shift-F5Del/Pur
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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ëëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitëë
□                                                                              □
□ SEQN    NodeNo    Temp-C    ThrMass    Dissip    Comment                     □
□  523    3105      30        -.0001     0         PIN THROUGH 6.04 POLY LAYERS       □
□  524    3102      30        -.0001     0         PIN THROUGH 6.04 COPPER LAYERS     □
□  525    3104      30        -.0001     0         PIN THROUGH 6.04 COPPER LAYERS     □
□  526    3106      30        -.0001     0         PIN THROUGH 6.04 COPPER LAYERS     □
□  527    3111      30        -.0001     .025      PIN THROUGH 6.05 POLY LAYERS       □
□  528    3113      30        -.0001     0.        PIN THROUGH 6.05 POLY LAYERS       □
□  529    3115      30        -.0001     0         PIN THROUGH 6.05 POLY LAYERS       □
□  530    3112      30        -.0001     0         PIN THROUGH 6.05 COPPER LAYER      □
□  531    3114      30        -.0001     0         PIN THROUGH 6.05 COPPER LAYER      □
□  532    3116      30        -.0001     0         PIN THROUGH 6.05 COPPER LAYER      □
□  533    3121      30        -.0003     .025      PIN THROUGH 6.06 POLY LAYERS       □
□  534    3123      30        -.0003     0         PIN THROUGH 6.06 POLY LAYERS       □
□  535    3125      30        -.0003     0         PIN THROUGH 6.06 POLY LAYERS       □
□  536    3122      30        -.0001     0         PIN THROUGH 6.06 COPPER LAYERS     □
□  537    3124      30        -.0001     0         PIN THROUGH 6.06 COPPER LAYERS     □
□  538    3126      30        -.0001     0         PIN THROUGH 6.06 COPPER LAYERS     □
□  539    3141      30        -.0002     .375      PIN THROUGH 7.01 POLY LAYERS       □
□  540    3143      30        -.0002     0         PIN THROUGH 7.01 POLY LAYERS       □
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CTRL-F1Import ITAS_NC    UDC Allowed                         PgDn PgUp Home End
SHFT-F1Import Column                     Shift-F5Del/Pur
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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ëëCtrl:Copyëëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitë£
□                                                                                □
□ SEQN    NodeNo   Temp-C   ThrMass   Dissip   Comment                           □
□  541    3145     30       -.0002    0        PIN THROUGH 7.01 POLY LAYERS      □
□  542    3142     30       -.0001    0        PIN THROUGH 7.01 COPPER LAYER     □
□  543    3144     30       -.0001    0        PIN THROUGH 7.01 COPPER LAYER     □
□  544    3146     30       -.0001    0        PIN THROUGH 7.01 COPPER LAYER     □
□  545    3151     30       -.0017    .105     PIN THROUGH 7.02 POLY LAYERS      □
□  546    3153     30       -.0017    0        PIN THROUGH 7.02 POLY LAYERS      □
□  547    3155     30       -.0017    0        PIN THROUGH 7.02 POLY LAYERS      □
□  548    3152     30       -.0001    0        PIN THROUGH 7.02 COPPER LAYERS    □
□  549    3154     30       -.0001    0        PIN THROUGH 7.02 COPPER LAYERS    □
□  550    3156     30       -.0001    0        PIN THROUGH 7.02 COPPER LAYERS    □
□  551    3161     30       -.0020    .150     PIN THROUGH 7.03 POLY LAYERS      □
□  552    3163     30       -.0020    0        PIN THROUGH 7.03 POLY LAYERS      □
□  553    3165     30       -.0020    0        PIN THROUGH 7.03 POLY LAYERS      □
□  554    3162     30       -.0001    0        PIN THROUGH 7.03 COPPER LAYERS    □
□  555    3164     30       -.0001    0        PIN THROUGH 7.03 COPPER LAYERS    □
□  556    3166     30       -.0001    0        PIN THROUGH 7.03 COPPER LAYERS    □
□  557    3171     30       -.0004    0        PIN THROUGH 8.00 POLY LAYERS      □
□  558    3173     30       -.0004    0        PIN THROUGH 8.00 POLY LAYERS      □
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CTRL-F1Import ITAS_NC    UDC Allowed                        PgDn PgUp Home End
SHFT-F1Import Column                          Shift-F5Del/Pur
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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ëëCtrl:Copyëëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëëESC:Quitë£
□                                                                                □
□ SEQN    NodeNo   Temp-C   ThrMass   Dissip   Comment                           □
□  559    3175     30       -.0004    0        PIN THROUGH 8.00 POLY LAYERS      □
□  560    3172     30       -.0001    0        PIN THROUGH 8.00 COPPER LAYERS    □
□  561    3174     30       -.0001    0        PIN THROUGH 8.00 COPPER LAYERS    □
□  562    3176     30       -.0001    0        PIN THROUGH 8.00 COPPER LAYERS    □
□  563    2056     30       -.0001    0        PIN THROUGH 3.05 COPPER LAYER     □
□  564    2124     30       -.0001    0        PIN THROUGH 3.12 COPPER LAYER     □
□  565    2126     30       -.0001    0        PIN THROUGH 3.12 COPPER LAYER     □
□                                                                                □
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CTRL-F1Import ITAS_NC    UDC Allowed                        PgDn PgUp Home End
SHFT-F1Import Column                          Shift-F5Del/Pur
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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APPENDIX L. NODE TO NODE CONDUCTANCE CALCULATIONS

HOUSING TO HOUSING NODES					
From	To	Area	Length	k	Conductance
901	905	0.3138	5.175	4.31	0.261348406
901	906	1.88	5.2845	4.31	1.53331441
901	911	0.3138	4.925	4.31	0.274614822
901	912	1.6	5.0845	4.31	1.356278887
902	903	0.3138	2.25	4.31	0.601101333
902	906	0 47	4.7845	4.31	0 423388024
902	907	0.3138	4.925	4.31	0.274614822
902	912	0.45	4.5845	4.31	0 423055949
903	904	0.3138	2.25	4.31	0.601101333
903	906	0 45	4.5845	4.31	0 423055949
903	912	0 45	4.5845	4.31	0 423055949
904	905	0.3138	2.25	4.31	0.601101333
904	906	0 45	4.5845	4.31	0 423055949
904	912	0 45	4.5845	4.31	0 423055949
905	906	0 45	4.5845	4.31	0 423055949
905	912	0 45	4.5845	4.31	0 423055949
907	906	4.925	1.6	4.31	13.26671875
907	908	0.3138	4.925	4.31	0.274614822
907	912	4.925	1.6	4.31	13.26671875
908	906	0 45	4.5845	4.31	0 423055949
908	909	0.3138	2.25	4.31	0.601101333
908	912	0 45	4.5845	4.31	0 423055949
909	906	0.45	4.5845	4.31	0.423055949
909	910	0.3138	2.25	4.31	0.601101333
909	912	0.45	4.5845	4.31	0.423055949
910	906	0.45	4.5845	4.31	0 423055949
910	911	0.3138	2.25	4.31	0.601101333
910	912	0.45	4.5845	4.31	0 423055949
911	906	0.45	4.5845	4.31	0 423055949
911	912	0.45	4.5845	4.31	0 423055949

		PCB BOARD TO RAIL CONDUCTANCES					
		FROM	TO	AREA	LENGTH	k	Conductance
BOTTOM RAIL TO		921	901	0.0625	4.6	4.31	0.058559783
EPS HOUSING (+Y)		921	907	0.0625	4.6	4.31	0.058559783
		921	902	0.587	0.225	4.31	11.24431111
		921	903	0.587	0.225	4.31	11.24431111
		921	904	0.587	0.225	4.31	11.24431111
		921	905	0.587	0.225	4.31	11.24431111
		921	906	2.25	2.25	4.31	4.31
MIDDLE RAIL TO		922	901	0.09375	4.6	4.31	0.087839674
EPS HOUSING (+Y)		922	907	0.09375	4.6	4.31	0.087839674
		922	902	0.881	0.225	4.31	16.87604444
		922	903	0.881	0.225	4.31	16.87604444
		922	904	0.881	0.225	4.31	16.87604444
		922	905	0.881	0.225	4.31	16.87604444
TOP RAIL TO		923	901	0.04975	4.6	4.31	0.046613587
EPS HOUSING (+Y)		923	907	0.04975	4.6	4.31	0.046613587
		923	902	0.4279	0.225	4.31	8.196662222
		923	903	0.4677	0.225	4.31	8.959053333
		923	904	0.4677	0.225	4.31	8.959053333
		923	905	0.4279	0.225	4.31	8.196662222
		923	906	1.791	2.25	4.31	3.43076
BOTTOM RAIL TO		924	901	0.0625	4.6	4.31	0.058559783
EPS HOUSING (-Y)		924	907	0.0625	4.6	4.31	0.058559783
		924	908	0.5875	0.225	4.31	11.25388889
		924	909	0.5875	0.225	4.31	11.25388889
		924	910	0.587	0.225	4.31	11.24431111
		924	911	0.5875	0.225	4.31	11.25388889
		924	912	2.25	2.25	4.31	4.31
MIDDLE RAIL TO		925	901	0.09375	4.6	4.31	0.087839674
EPS HOUSING (-Y)		925	907	0.09375	4.6	4.31	0.087839674
		925	908	0.881	0.225	4.31	16.87604444
		925	909	0.881	0.225	4.31	16.87604444
		925	910	0.881	0.225	4.31	16.87604444
		925	911	0.881	0.225	4.31	16.87604444
TOP RAIL TO		926	901	0.04975	4.6	4.31	0.046613587
EPS HOUSING (-Y)		926	907	0.04975	4.6	4.31	0.046613587
		926	908	0.4279	0.225	4.31	8.196662222
		926	909	0.4677	0.225	4.31	8.959053333
		926	910	0.4677	0.225	4.31	8.959053333
		926	911	0.4279	0.225	4.31	8.196662222
		926	912	1.791	2.25	4.31	3.43076

PCB TO RAILINGS

	FROM	TO	A1,2	L1	L2	k-Cu/kpol	k-Al	hc'	hc	K1	K2	K0
BOTTOM	1601	924	0.25	0.00067	0.125	9.65	4.31	3.78	0.945	3600.746	8.62	0.851435
PCB	1602	924	0.39	0.00067	0.125	9.65	4.31	3.78	1.4742	5617.164	13.4472	1.328238
THRMAL	1603	924	0.281	0.00067	0.125	9.65	4.31	3.78	1.06218	4047.239	9.68888	0.957013
LAYER	1604	924	0.328	0.00067	0.125	9.65	4.31	3.78	1.23984	4724.179	11.30944	1.117082
TO	1605	924	0.125	0.00067	0.125	9.65	4.31	3.78	0.4725	1800.373	4.31	0.425717
BOTTOM	1606	924	0.625	0.00067	0.125	9.65	4.31	3.78	2.3625	9001.866	21.55	2.128587
RAIL	1617	924	0.25	0.00067	0.125	9.65	4.31	3.78	0.945	3600.746	8.62	0.851435
	1601	921	0.25	0.00067	0.125	9.65	4.31	3.78	0.945	3600.746	8.62	0.851435
	1614	921	0.39	0.00067	0.125	9.65	4.31	3.78	1.4742	5617.164	13.4472	1.328238
	1615	921	0.609	0.00067	0.125	9.65	4.31	3.78	2.30202	8771.418	20.99832	2.074095
	1616	921	0.75	0.00067	0.125	9.65	4.31	3.78	2.835	10802.24	25.86	2.554304
	1617	921	0.25	0.00067	0.125	9.65	4.31	3.78	0.945	3600.746	8.62	0.851435
BOTTOM	1101	925	0.25	0.00967	0.1875	0.2	4.31	0.242	0.0605	5.170631	5.746667	0.059184
PCB POLY	1102	925	0.39	0.00967	0.1875	0.2	4.31	0.242	0.09438	8.066184	8.9648	0.092328
LAYER	1103	925	0.281	0.00967	0.1875	0.2	4.31	0.242	0.068002	5.811789	6.459253	0.066523
TO	1104	925	0.328	0.00967	0.1875	0.2	4.31	0.242	0.079376	6.783868	7.539627	0.07765
MIDDLE	1105	925	0.125	0.00967	0.1875	0.2	4.31	0.242	0.03025	2.585315	2.873333	0.029592
RAIL	1106	925	0.625	0.00967	0.1875	0.2	4.31	0.242	0.15125	12.92658	14.36667	0.147961
	1117	925	0.25	0.00967	0.1875	0.2	4.31	0.242	0.0605	5.170631	5.746667	0.059184
	1101	922	0.25	0.00967	0.1875	0.2	4.31	0.242	0.0605	5.170631	5.746667	0.059184
	1114	922	0.39	0.00967	0.1875	0.2	4.31	0.242	0.09438	8.066184	8.9648	0.092328
	1115	922	0.609	0.00967	0.1875	0.2	4.31	0.242	0.147378	12.59566	13.99888	0.144173
	1116	922	0.75	0.00967	0.1875	0.2	4.31	0.242	0.1815	15.51189	17.24	0.177553
	1117	922	0.25	0.00967	0.1875	0.2	4.31	0.242	0.0605	5.170631	5.746667	0.059184
TOP PCB	601	925	0.3438	0.00067	0.1875	9.65	4.31	3.78	1.299564	4951.746	7.902816	1.115788
THERMAL	602	925	0.4688	0.00067	0.1875	9.65	4.31	3.78	1.772064	6752.119	10.77615	1.521469
LAYER	603	925	0.125	0.00067	0.1875	9.65	4.31	3.78	0.4725	1800.373	2.873333	0.405682
TO	604	925	0.5	0.00067	0.1875	9.65	4.31	3.78	1.89	7201.493	11.49333	1.622728
MIDDLE	605	925	0.125	0.00067	0.1875	9.65	4.31	3.78	0.4725	1800.373	2.873333	0.405682
RAIL	606	925	0.6875	0.00067	0.1875	9.65	4.31	3.78	2.59875	9902.052	15.80333	2.231251
	625	922	0.6875	0.00067	0.1875	9.65	4.31	3.78	2.59875	9902.052	15.80333	2.231251
	626	922	0.3438	0.00067	0.1875	9.65	4.31	3.78	1.299564	4951.746	7.902816	1.115788
	627	922	0.3438	0.00067	0.1875	9.65	4.31	3.78	1.299564	4951.746	7.902816	1.115788

	628	922	0.3438	0.00067	0.1875	9.65	4.31	3.78	1.299564	4951.746	7.902816	1.115788
	629	922	0.3438	0.00067	0.1875	9.65	4.31	3.78	1.299564	4951.746	7.902816	1.115788
	630	922	0.6875	0.00067	0.1875	9.65	4.31	3.78	2.59875	9902.052	15.80333	2.231251
TOP PCB	101	926	0.3438	0.00967	0.0995	0.2	4.31	0.242	0.0832	7.110651	14.89224	0.081786
THERMAL	102	926	0.4688	0.00967	0.0995	0.2	4.31	0.242	0.11345	9.695967	20.30681	0.111522
LAYER	103	926	0.125	0.00967	0.0995	0.2	4.31	0.242	0.03025	2.585315	5.414573	0.029736
TO	104	926	0.5	0.00967	0.0995	0.2	4.31	0.242	0.121	10.34126	21.65829	0.118944
MIDDLE	105	926	0.125	0.00967	0.0995	0.2	4.31	0.242	0.03025	2.585315	5.414573	0.029736
RAIL	106	926	0.6875	0.00967	0.0995	0.2	4.31	0.242	0.166375	14.21923	29.78015	0.163548
	125	923	0.6875	0.00967	0.0995	0.2	4.31	0.242	0.166375	14.21923	29.78015	0.163548
	126	923	0.3438	0.00967	0.0995	0.2	4.31	0.242	0.0832	7.110651	14.89224	0.081786
	127	923	0.3438	0.00967	0.0995	0.2	4.31	0.242	0.0832	7.110651	14.89224	0.081786
	128	923	0.3438	0.00967	0.0995	0.2	4.31	0.242	0.0832	7.110651	14.89224	0.081786
	129	923	0.3438	0.00967	0.0995	0.2	4.31	0.242	0.0832	7.110651	14.89224	0.081786
	130	923	0.6875	0.00967	0.0995	0.2	4.31	0.242	0.166375	14.21923	29.78015	0.163548

		TOP PCB THERMAL LAYER NODE TO NODE					
		FROM	TO	AREA	LENGTH	k	Conductance
APPLIES TO LAYERS		601	602	0.003183	1.625	9.65	0.018902123
4XX AND 2XX		601	607	0.00184	2.625	9.65	0.00676419
		602	603	0.003183	1.1875	9.65	0.025866063
		602	608	0.02513	2.625	9.65	0.092382667
		603	604	0.003138	1.25	9.65	0.02422536
		603	609	0.0007	2.625	9.65	0.002573333
		604	605	0.003183	1.25	9.65	0.02457276
		604	610	0.00268	2.625	9.65	0.00985219
		605	606	0.003138	2	9.65	0.018634892
		605	611	0.0007	2.625	9.65	0.002573333
		606	612	0.00369	2.625	9.65	0.013565143
		607	608	0.00385	1.625	9.65	0.022863077
		607	613	0.00184	1.84375	9.65	0.009630373
		608	609	0.00385	1.875	9.65	0.019814667
		608	613	0.0005	1.84375	9.65	0.002616949
		608	614	0.00184	1.84375	9.65	0.009630373
		608	615	0.00775	1.84375	9.65	0.040562712
		609	610	0.00385	1.25	9.65	0.029722
		609	615	0.0007	1.84375	9.65	0.003663729
		610	611	0.00385	1.25	9.65	0.029722
		610	615	0.001	1.84375	9.65	0.005233898
		610	616	0.00168	1.84375	9.65	0.008792949
		611	612	0.00385	1.625	9.65	0.022863077
		611	616	0.00168	1.84375	9.65	0.008792949
		611	617	0.0005	1.84375	9.65	0.002616949
		612	617	0.00134	1.84375	9.65	0.007013424
		612	618	0.00235	1.84375	9.65	0.012299661
		613	614	0.00116	1.5625	9.65	0.00716416
		613	619	0.00235	0.9375	9.65	0.024189333
		614	615	0.00116	1.375	9.65	0.008141091
		614	620	0.00184	0.9375	9.65	0.018939733
		615	616	0.00116	1.375	9.65	0.008141091

		615	621	0.00178	0.9375	9.65	0.018322133
		616	617	0.00116	1.375	9.65	0.008141091
		616	622	0.00184	0.9375	9.65	0.018939733
		617	618	0.00116	2	9.65	0.00716416
		617	623	0.00184	0.9375	9.65	0.018939733
		618	624	0.001	0.9375	9.65	0.010293333
		619	620	0.00142	1.5625	9.65	0.00876992
		619	625	0.00235	0.96875	9.65	0.023409032
		620	621	0.00142	1.375	9.65	0.009965818
		620	626	0.00184	0.96875	9.65	0.018328774
		621	622	0.00142	1.375	9.65	0.009965818
		621	627	0.00178	0.96875	9.65	0.017731097
		622	623	0.00142	0.96875	9.65	0.014145032
		622	628	0.00184	1.375	9.65	0.012913455
		623	624	0.00142	1.5625	9.65	0.00876992
		623	629	0.00184	0.96875	9.65	0.018328774
		624	630	0.001	0.96875	9.65	0.00996129
		625	626	0.00173	1.5625	9.65	0.01068448
		626	627	0.00173	1.375	9.65	0.012141455
		627	628	0.00173	1.375	9.65	0.012141455
		628	629	0.00173	1.375	9.65	0.012141455
		629	630	0.00173	1.5625	9.65	0.01068448

TOP PCB POLYIMIDE LAYER NODE TO NODE

APPLIES TO LAYERS	FROM	TO	AREA	LENGTH	k	CONDUCTANCE
3XX AND 1XX	501	502	0.04591	1.625	0.2	0.005650462
	501	507	0.02658	2.625	0.2	0.002025143
	502	503	0.04591	1.1874	0.2	0.007732862
	502	508	0.03624	2.625	0.2	0.002761143
	503	504	0.04591	1.25	0.2	0.0073456
	503	509	0.09665	2.625	0.2	0.00736381
	504	505	0.04591	1.25	0.2	0.0073456
	504	510	0.03866	2.625	0.2	0.002945524
	505	506	0.04591	1.625	0.2	0.005650462
	505	511	0.09665	2.625	0.2	0.00736381
	506	512	0.05316	2.625	0.2	0.004050286
	507	508	0.05557	1.625	0.2	0.006839385
	507	513	0.02658	1.184375	0.2	0.004488443
	508	509	0.05557	1.1875	0.2	0.009359158
	508	513	0.00725	1.184375	0.2	0.001224274
	508	514	0.02658	1.184375	0.2	0.004488443
	508	515	0.00242	1.184375	0.2	0.000408654
	509	510	0.05557	1.25	0.2	0.0088912
	509	515	0.09665	1.184375	0.2	0.016320844
	510	511	0.05557	1.25	0.2	0.0088912
	510	515	0.0145	1.184375	0.2	0.002448549
	510	516	0.024163	1.184375	0.2	0.004080296
	511	512	0.05557	2	0.2	0.006839385
	511	516	0.02416	1.184375	0.2	0.004079789
	511	517	0.007249	1.184375	0.2	0.001224106
	512	517	0.01933	1.184375	0.2	0.003264169
	512	518	0.033828	1.184375	0.2	0.00571238
	513	514	0.01576	1.562	0.2	0.002017926
	513	519	0.03383	0.9375	0.2	0.007217067
	514	515	0.015706	1.375	0.2	0.002284509
	514	520	0.02658	0.9375	0.2	0.0056704
	515	516	0.015706	1.375	0.2	0.002284509
	515	521	0.02658	0.9375	0.2	0.0056704

	516	517	0.015706	1.375	0.2	0.002284509
	516	522	0.02658	0.9375	0.2	0.0056704
	517	518	0.015706	1.5625	0.2	0.002010368
	517	523	0.02658	0.9375	0.2	0.0056704
	518	524	0.03383	0.9375	0.2	0.007217067
	519	520	0.02054	1.5625	0.2	0.00262912
	519	525	0.03383	0.96875	0.2	0.006984258
	520	521	0.02054	1.375	0.2	0.002987636
	520	526	0.02658	0.96875	0.2	0.005487484
	521	522	0.02054	1.375	0.2	0.002987636
	521	527	0.02658	0.96875	0.2	0.005487484
	522	523	0.02054	1.375	0.2	0.002987636
	522	528	0.02658	0.96875	0.2	0.005487484
	523	524	0.02054	1.5625	0.2	0.00262912
	523	529	0.02658	0.96875	0.2	0.005487484
	524	530	0.03383	0.96875	0.2	0.006984258
	525	526	0.01691	1.5625	0.2	0.00216448
	526	527	0.01691	1.375	0.2	0.002459636
	527	528	0.01691	1.375	0.2	0.002459636
	528	529	0.01691	1.375	0.2	0.002459636
	529	530	0.01691	1.5625	0.2	0.00216448

			TOP PCB LAYER CONDUCTANCES									
APPLIES TO	FROM	TO	A1,2	L1	L2	k-Cu	k-poly	hc'	hc	K1	K2	K0
ALL TOP PCB	601	501	3.2656	0.00067	0.00967	9.65	0.2	0.1933	0.63124	974.806	67.54085	0.624995
LAYERS	602	502	4.4531	0.00067	0.00967	9.65	0.2	0.1933	0.860784	1329.284	92.10134	0.852267
	603	503	1.1875	0.00067	0.00967	9.65	0.2	0.1933	0.229544	354.4776	24.5605	0.227272
	604	504	4.75	0.00067	0.00967	9.65	0.2	0.1933	0.918175	1417.91	98.24199	0.90909
	605	505	4.75	0.00067	0.00967	9.65	0.2	0.1933	0.918175	1417.91	98.24199	0.90909
	606	506	6.531	0.00067	0.00967	9.65	0.2	0.1933	1.262442	1949.552	135.0776	1.249951
	607	507	3.953	0.00067	0.00967	9.65	0.2	0.1933	0.764115	1180	81.75801	0.756554
	608	508	5.391	0.00067	0.00967	9.65	0.2	0.1933	1.04208	1609.254	111.4995	1.031769
	609	509	1.4375	0.00067	0.00967	9.65	0.2	0.1933	0.277869	429.1045	29.73113	0.275119
	610	510	5.75	0.00067	0.00967	9.65	0.2	0.1933	1.111475	1716.418	118.9245	1.100477
	611	511	5.75	0.00067	0.00967	9.65	0.2	0.1933	1.111475	1716.418	118.9245	1.100477
	612	512	7.906	0.00067	0.00967	9.65	0.2	0.1933	1.52823	2360	163.516	1.513108
	613	513	1.421	0.00067	0.00967	9.65	0.2	0.1933	0.274679	424.1791	29.38987	0.271961
	614	514	1.117	0.00067	0.00967	9.65	0.2	0.1933	0.215916	333.4328	23.10238	0.21378
	615	515	1.117	0.00067	0.00967	9.65	0.2	0.1933	0.215916	333.4328	23.10238	0.21378
	616	516	1.117	0.00067	0.00967	9.65	0.2	0.1933	0.215916	333.4328	23.10238	0.21378
	617	517	1.117	0.00067	0.00967	9.65	0.2	0.1933	0.215916	333.4328	23.10238	0.21378
	618	518	1.421	0.00067	0.00967	9.65	0.2	0.1933	0.274679	424.1791	29.38987	0.271961
	619	519	1.859	0.00067	0.00967	9.65	0.2	0.1933	0.359345	554.9254	38.44881	0.355789
	620	520	1.461	0.00067	0.00967	9.65	0.2	0.1933	0.282411	436.1194	30.21717	0.279617
	621	521	1.461	0.00067	0.00967	9.65	0.2	0.1933	0.282411	436.1194	30.21717	0.279617
	622	522	1.461	0.00067	0.00967	9.65	0.2	0.1933	0.282411	436.1194	30.21717	0.279617
	623	523	1.461	0.00067	0.00967	9.65	0.2	0.1933	0.282411	436.1194	30.21717	0.279617
	624	524	1.859	0.00067	0.00967	9.65	0.2	0.1933	0.359345	554.9254	38.44881	0.355789
	625	525	1.531	0.00067	0.00967	9.65	0.2	0.1933	0.295942	457.0149	31.66494	0.293014
	626	526	1.203	0.00067	0.00967	9.65	0.2	0.1933	0.23254	359.1045	24.88108	0.230239
	627	527	1.203	0.00067	0.00967	9.65	0.2	0.1933	0.23254	359.1045	24.88108	0.230239
	628	528	1.203	0.00067	0.00967	9.65	0.2	0.1933	0.23254	359.1045	24.88108	0.230239
	629	529	1.203	0.00067	0.00967	9.65	0.2	0.1933	0.23254	359.1045	24.88108	0.230239
	630	530	1.531	0.00067	0.00967	9.65	0.2	0.1933	0.295942	457.0149	31.66494	0.293014

				BOTTOM PCB THERMAL LAYER NODE TO NODE			
	FROM	TO	AREA	LENGTH	k	CONDUCTANCE	
APPLIES TO LAYERS	1601	1602	0.00402	1.281	0.2	0.000627635	
4XX AND 2XX	1601	1607	0.00201	1.281	0.2	0.000313817	
	1601	1614	0.00469	1.281	0.2	0.00073224	
	1602	1603	0.00402	1.3438	0.2	0.000598303	
	1602	1607	0.00294	2.25	0.2	0.000261333	
	1603	1604	0.00402	1.2188	0.2	0.000659665	
	1603	1608	0.00151	2.25	0.2	0.000134222	
	1604	1605	0.00402	0.906	0.2	0.000887417	
	1604	1609	0.00059	2.25	0.2	5.24444E-05	
	1604	1610	0.0005	2.25	0.2	4.44444E-05	
	1604	1611	0.00067	2.25	0.2	5.95556E-05	
	1605	1606	0.00402	1.5	0.2	0.000536	
	1605	1612	0.00059	2.25	0.2	5.24444E-05	
	1606	1617	0.00402	1.75	0.2	0.000459429	
	1606	1613	0.00335	2.25	0.2	0.000297778	
	1607	1608	0.00201	1.3438	0.2	0.000299152	
	1607	1614	0.002094	2.25	0.2	0.000186133	
	1608	1609	0.00201	1.438	0.2	0.000279555	
	1608	1615	0.001508	2.25	0.2	0.000134044	
	1609	1610	0.00201	0.406	0.2	0.000990148	
	1609	1615	0.00059	2.25	0.2	5.24444E-05	
	1610	1611	0.00201	0.438	0.2	0.000917808	
	1610	1615	0.0005	2.25	0.2	4.44444E-05	
	1611	1612	0.00201	0.5	0.2	0.000804	
	1611	1615	0.00067	2.25	0.2	5.95556E-05	
	1612	1613	0.00201	1.5	0.2	0.000268	
	1612	1616	0.00067	2.25	0.2	5.95556E-05	
	1613	1617	0.00335	1.75	0.2	0.000382857	
	1613	1616	0.00469	2.5	0.2	0.0003752	
	1614	1615	0.00469	2	0.2	0.000469	
	1615	1616	0.00469	2.719	0.2	0.00034498	
	1616	1617	0.00469	2	0.2	0.000469	

BOTTOM PCB POLY LAYER NODE TO NODE

APPLIES TO LAYERS		FROM	TO	AREA	LENGTH	k	CONDUCTANCE
13XX TO 11XX		1501	1502	0.058	1.281	0.2	0.009055425
		1501	1507	0.029	1.281	0.2	0.004527713
		1501	1514	0.0677	1.281	0.2	0.010569867
		1502	1503	0.058	1.344	0.2	0.008630952
		1502	1507	0.0302	2.25	0.2	0.002684444
		1503	1504	0.058	1.219	0.2	0.009515997
		1503	1508	0.0217	2.25	0.2	0.001928889
		1504	1505	0.058	0.906	0.2	0.012803532
		1504	1509	0.00846	2.25	0.2	0.000752
		1504	1510	0.00725	2.25	0.2	0.000644444
		1504	1511	0.00967	2.25	0.2	0.000859556
		1505	1506	0.058	1.5	0.2	0.007733333
		1505	1512	0.00967	2.25	0.2	0.000859556
		1506	1517	0.058	1.75	0.2	0.006628571
		1506	1513	0.0483	2.25	0.2	0.004293333
		1507	1508	0.029	1.344	0.2	0.004315476
		1507	1514	0.0302	2.5	0.2	0.002416
		1508	1509	0.029	1.438	0.2	0.00403338
		1508	1515	0.029	2.5	0.2	0.00232
		1509	1510	0.029	0.406	0.2	0.014285714
		1509	1515	0.00864	2.5	0.2	0.0006912
		1510	1511	0.029	0.438	0.2	0.013242009
		1510	1515	0.00725	2.5	0.2	0.00058
		1511	1512	0.029	0.5	0.2	0.0116
		1511	1515	0.00967	2.5	0.2	0.0007736
		1512	1513	0.029	1.5	0.2	0.003866667
		1512	1516	0.00967	2.5	0.2	0.0007736
		1513	1517	0.029	1.75	0.2	0.003314286
		1513	1516	0.0483	2.5	0.2	0.003864
		1514	1515	0.0677	2	0.2	0.00677
		1515	1516	0.0677	2.719	0.2	0.004979772
		1516	1517	0.0677	2	0.2	0.00677

BOTTOM PCB LAYER CONDUCTANCES

LAYERS	FROM	TO	A1,2	L-Cu	L-poly	k-Cu	k-poly	hc'	hc	K1	K2	K0
16XX TO 15XX	1601	1501	8	0.00067	0.00967	9.65	0.2	0.1933	1.5464	115223.9	165.4602	1.532061
	1602	1502	4.688	0.00067	0.00967	9.65	0.2	0.1933	0.90619	67521.19	96.95967	0.897788
APPLIES TO	1603	1503	3.375	0.00067	0.00967	9.65	0.2	0.1933	0.652388	48610.07	69.80352	0.646338
ALL LAYER	1604	1504	3.938	0.00067	0.00967	9.65	0.2	0.1933	0.761215	56718.96	81.44778	0.754157
TO LAYER	1605	1505	1.5	0.00067	0.00967	9.65	0.2	0.1933	0.28995	21604.48	31.02378	0.287261
CONDUCTANCES	1606	1506	7.5	0.00067	0.00967	9.65	0.2	0.1933	1.44975	108022.4	155.1189	1.436307
	1607	1507	2.344	0.00067	0.00967	9.65	0.2	0.1933	0.453095	33760.6	48.47983	0.448894
	1608	1508	1.688	0.00067	0.00967	9.65	0.2	0.1933	0.32629	24312.24	34.9121	0.323265
	1609	1509	0.6536	0.00067	0.00967	9.65	0.2	0.1933	0.126341	9413.791	13.5181	0.125169
	1610	1510	0.562	0.00067	0.00967	9.65	0.2	0.1933	0.108635	8094.478	11.62358	0.107627
	1611	1511	0.75	0.00067	0.00967	9.65	0.2	0.1933	0.144975	10802.24	15.51189	0.143631
	1612	1512	0.75	0.00067	0.00967	9.65	0.2	0.1933	0.144975	10802.24	15.51189	0.143631
	1613	1513	3.75	0.00067	0.00967	9.65	0.2	0.1933	0.724875	54011.19	77.55946	0.718153
	1614	1514	5.471	0.00067	0.00967	9.65	0.2	0.1933	1.057544	78798.73	113.1541	1.047738
	1615	1515	8.531	0.00067	0.00967	9.65	0.2	0.1933	1.649042	122871.9	176.4426	1.633751
	1616	1516	10.5	0.00067	0.00967	9.65	0.2	0.1933	2.02965	151231.3	217.1665	2.01083
	1617	1517	8	0.00067	0.00967	9.65	0.2	0.1933	1.5464	115223.9	165.4602	1.532061

FROM	TO	AREA	k-Ni	L1	K1	R1	K tot	k (Cu/poly)	hc'	hc	L2	K2	K0
2011	101	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2013	301	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2015	501	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2012	201	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2014	401	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2016	601	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2021	102	0.00204	1.77	0.0165	0.218836	4.569624	5.033236	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2023	302	0.00204	1.77	0.0165	0.218836	4.569624	5.033236	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2025	502	0.00204	1.77	0.0165	0.218836	4.569624	5.033236	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2022	202	0.000139	1.77	0.0165	0.014911	67.06499	0.342951	9.65	1.476	0.000205	0.25	0.005365	0.000197
2024	402	0.000139	1.77	0.0165	0.014911	67.06499	0.342951	9.65	1.476	0.000205	0.25	0.005365	0.000197
2026	602	0.000139	1.77	0.0165	0.014911	67.06499	0.342951	9.65	1.476	0.000205	0.25	0.005365	0.000197
2031	103	0.00204	1.77	0.0165	0.218836	4.569624	0.875345	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2033	303	0.00204	1.77	0.0165	0.218836	4.569624	0.875345	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2035	503	0.00204	1.77	0.0165	0.218836	4.569624	0.875345	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2032	203	0.000139	1.77	0.0165	0.014911	67.06499	0.059644	9.65	1.476	0.000205	0.25	0.005365	0.000197
2034	403	0.000139	1.77	0.0165	0.014911	67.06499	0.059644	9.65	1.476	0.000205	0.25	0.005365	0.000197
2036	603	0.000139	1.77	0.0165	0.014911	67.06499	0.059644	9.65	1.476	0.000205	0.25	0.005365	0.000197
2041	104	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2043	304	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2045	504	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2042	204	0.000139	1.77	0.0165	0.014911	67.06499	0.372773	9.65	1.476	0.000205	0.25	0.005365	0.000198
2044	404	0.000139	1.77	0.0165	0.014911	67.06499	0.372773	9.65	1.476	0.000205	0.25	0.005365	0.000198
2046	604	0.000139	1.77	0.0165	0.014911	67.06499	0.372773	9.65	1.476	0.000205	0.25	0.005365	0.000198
2051	105	0.00204	1.77	0.0165	0.218836	4.569624	0.656509	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2053	305	0.00204	1.77	0.0165	0.218836	4.569624	0.656509	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2055	505	0.00204	1.77	0.0165	0.218836	4.569624	0.656509	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2052	205	0.000139	1.77	0.0165	0.014911	67.06499	0.044733	9.65	1.476	0.000205	0.25	0.005365	0.000197
2054	405	0.000139	1.77	0.0165	0.014911	67.06499	0.044733	9.65	1.476	0.000205	0.25	0.005365	0.000197
2056	605	0.000139	1.77	0.0165	0.014911	67.06499	0.044733	9.65	1.476	0.000205	0.25	0.005365	0.000197
2061	106	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2063	306	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2065	506	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.25	0.001632	0.000296

2251	125	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2253	325	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2255	525	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2252	225	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2254	425	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2256	625	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2261	126	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2263	326	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2265	526	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2262	226	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2264	426	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2266	626	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2271	127	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2273	327	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2275	527	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2272	227	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2274	427	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2276	627	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2281	128	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2283	328	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2285	528	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2282	228	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2284	428	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2286	628	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2291	129	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2293	329	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2295	529	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2292	229	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2294	429	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2296	629	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2301	130	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2303	330	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2305	530	0.00204	1.77	0.0165	0.218836	4.569624	1.313018	0.2	0.1773	0.000362	0.25	0.001632	0.000296
2302	230	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2304	430	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197
2306	630	0.000139	1.77	0.0165	0.014911	67.06499	0.089465	9.65	1.476	0.000205	0.25	0.005365	0.000197

FROM	TO	AREA	k-Ni	L1	K1	R1	Ktot	k(Cu/poly)	hc'	hc	L2	K2	K0
3011	1101	0.00204	1.77	0.0165	0.218836	4.569624	14.00553	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3013	1301	0.00204	1.77	0.0165	0.218836	4.569624	14.00553	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3015	1501	0.00204	1.77	0.0165	0.218836	4.569624	14.00553	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3012	1201	0.00139	1.77	0.0165	0.149109	6.706499	9.542982	9.65	1.476	0.002052	0.025	0.53654	0.002043
3014	1401	0.00139	1.77	0.0165	0.149109	6.706499	9.542982	9.65	1.476	0.002052	0.025	0.53654	0.002043
3016	1601	0.00139	1.77	0.0165	0.149109	6.706499	9.542982	9.65	1.476	0.002052	0.025	0.53654	0.002043
3021	1102	0.00204	1.77	0.0165	0.218836	4.569624	7.440436	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3023	1302	0.00204	1.77	0.0165	0.218836	4.569624	7.440436	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3025	1502	0.00204	1.77	0.0165	0.218836	4.569624	7.440436	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3022	1202	0.00139	1.77	0.0165	0.149109	6.706499	5.069709	9.65	1.476	0.002052	0.025	0.53654	0.002043
3024	1402	0.00139	1.77	0.0165	0.149109	6.706499	5.069709	9.65	1.476	0.002052	0.025	0.53654	0.002043
3026	1602	0.00139	1.77	0.0165	0.149109	6.706499	5.069709	9.65	1.476	0.002052	0.025	0.53654	0.002043
3031	1103	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3033	1303	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3035	1503	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3032	1203	0.00139	1.77	0.0165	0.149109	6.706499	4.771491	9.65	1.476	0.002052	0.025	0.53654	0.002043
3034	1403	0.00139	1.77	0.0165	0.149109	6.706499	4.771491	9.65	1.476	0.002052	0.025	0.53654	0.002043
3036	1603	0.00139	1.77	0.0165	0.149109	6.706499	4.771491	9.65	1.476	0.002052	0.025	0.53654	0.002043
3041	1104	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3043	1304	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3045	1504	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3042	1204	0.00139	1.77	0.0165	0.149109	6.706499	4.771491	9.65	1.476	0.002052	0.025	0.53654	0.002043
3044	1404	0.00139	1.77	0.0165	0.149109	6.706499	4.771491	9.65	1.476	0.002052	0.025	0.53654	0.002043
3046	1604	0.00139	1.77	0.0165	0.149109	6.706499	4.771491	9.65	1.476	0.002052	0.025	0.53654	0.002043
3051	1105	0.00204	1.77	0.0165	0.218836	4.569624	6.127418	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3053	1305	0.00204	1.77	0.0165	0.218836	4.569624	6.127418	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3055	1505	0.00204	1.77	0.0165	0.218836	4.569624	6.127418	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3052	1205	0.00139	1.77	0.0165	0.149109	6.706499	4.175055	9.65	1.476	0.002052	0.025	0.53654	0.002043
3054	1405	0.00139	1.77	0.0165	0.149109	6.706499	4.175055	9.65	1.476	0.002052	0.025	0.53654	0.002043
3056	1605	0.00139	1.77	0.0165	0.149109	6.706499	4.175055	9.65	1.476	0.002052	0.025	0.53654	0.002043
3061	1106	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3063	1306	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3065	1506	0.00204	1.77	0.0165	0.218836	4.569624	7.002764	0.2	0.1773	0.000362	0.025	0.01632	0.000354

3154	1415	0.00139	1.77	0.0165	0.149109	6.706499	14.91091	9.65	1.476	0.002052	0.025	0.53654	0.002044
3156	1615	0.00139	1.77	0.0165	0.149109	6.706499	14.91091	9.65	1.476	0.002052	0.025	0.53654	0.002044
3161	1116	0.00204	1.77	0.0165	0.218836	4.569624	24.94735	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3163	1316	0.00204	1.77	0.0165	0.218836	4.569624	24.94735	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3165	1516	0.00204	1.77	0.0165	0.218836	4.569624	24.94735	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3162	1216	0.00139	1.77	0.0165	0.149109	6.706499	16.99844	9.65	1.476	0.002052	0.025	0.53654	0.002044
3164	1416	0.00139	1.77	0.0165	0.149109	6.706499	16.99844	9.65	1.476	0.002052	0.025	0.53654	0.002044
3166	1616	0.00139	1.77	0.0165	0.149109	6.706499	16.99844	9.65	1.476	0.002052	0.025	0.53654	0.002044
3171	1117	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3173	1317	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3175	1517	0.00204	1.77	0.0165	0.218836	4.569624	5.470909	0.2	0.1773	0.000362	0.025	0.01632	0.000354
3172	1217	0.00139	1.77	0.0165	0.149109	6.706499	3.727727	9.65	1.476	0.002052	0.025	0.53654	0.002043
3174	1417	0.00139	1.77	0.0165	0.149109	6.706499	3.727727	9.65	1.476	0.002052	0.025	0.53654	0.002043
3176	1617	0.00139	1.77	0.0165	0.149109	6.706499	3.727727	9.65	1.476	0.002052	0.025	0.53654	0.002043

PIN TO PIN CONDUCTANCES

	FROM	TO	# OF PINS	AREA	ADJ AREA	LENGTH	k	K
	2011	2012	6	0.0008553	0.0051318	0.06201	1.77	0.146481
	2021	2022	23	0.0008553	0.0196719	0.237705	1.77	0.146481
	2031	2032	4	0.0008553	0.0034212	0.04134	1.77	0.146481
	2041	2042	25	0.0008553	0.0213825	0.258375	1.77	0.146481
	2051	2052	3	0.0008553	0.0025659	0.031005	1.77	0.146481

APPENDIX M. ITAS CONDUCTANCE DATA

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Ctrl:Copy                ITAS Conductor Data Entry                ESC:Quit
 SqNo FACTOR From    To      Cond. Value  L/R Description
    1 1      1       901     1000         L  GEOMETRY TO HOUSING NODE
    2 1      2       902     1000         L  GEOMETRY TO HOUSING NODE
    3 1      3       903     1000         L  GEOMETRY TO HOUSING NODE
    4 1      4       904     1000         L  GEOMETRY TO HOUSING NODE
    5 1      5       905     1000         L  GEOMETRY TO HOUSING NODE
    6 1      6       906     1000         L  GEOMETRY TO HOUSING NODE
    7 1      7       907     1000         L  GEOMETRY TO HOUSING NODE
    8 1      8       908     1000         L  GEOMETRY TO HOUSING NODE
    9 1      9       909     1000         L  GEOMETRY TO HOUSING NODE
   10 1      10      910     1000         L  GEOMETRY TO HOUSING NODE
   11 1      11      911     1000         L  GEOMETRY TO HOUSING NODE
   12 1      12      912     1000         L  GEOMETRY TO HOUSING NODE
   13 1      13      613     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   14 1      14      614     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   15 1      15      615     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   16 1      16      616     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   17 1      17      617     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   18 1      18      618     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur              End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

Ctrl:Copy                ITAS Conductor Data Entry                ESC:Quit
 SqNo FACTOR From    To      Cond. Value  L/R Description
   19 1      19      619     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   20 1      20      620     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   21 1      21      621     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   22 1      22      622     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   23 1      23      623     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   24 1      24      624     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   25 1      25      625     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   26 1      26      626     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   27 1      27      627     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   28 1      28      628     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   29 1      29      629     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   30 1      30      630     1000         L  GEOMETRY TO PCB1 THERMAL LAYER
   31 1      31      601     1000         L  GEOMETRY TO TOP PCB THERMAL LAYER
   32 1      32      602     1000         L  GEOMETRY TO TOP PCB THERMAL LAYER
   33 1      33      603     1000         L  GEOMETRY TO TOP PCB THERMAL LAYER
   34 1      34      604     1000         L  GEOMETRY TO TOP PCB THERMAL LAYER
   35 1      35      605     1000         L  GEOMETRY TO TOP PCB THERMAL LAYER
   36 1      36      606     1000         L  GEOMETRY TO TOP PCB THERMAL LAYER
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur              End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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□                                                                              □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                       □
□    1 1      1      901    1000          L  GEOMETRY TO HOUSING NODE          □
□    2 1      2      902    1000          L  GEOMETRY TO HOUSING NODE          □
□    3 1      3      903    1000          L  GEOMETRY TO HOUSING NODE          □
□    4 1      4      904    1000          L  GEOMETRY TO HOUSING NODE          □
□    5 1      5      905    1000          L  GEOMETRY TO HOUSING NODE          □
□    6 1      6      906    1000          L  GEOMETRY TO HOUSING NODE          □
□    7 1      7      907    1000          L  GEOMETRY TO HOUSING NODE          □
□    8 1      8      908    1000          L  GEOMETRY TO HOUSING NODE          □
□    9 1      9      909    1000          L  GEOMETRY TO HOUSING NODE          □
□   10 1      10     910    1000          L  GEOMETRY TO HOUSING NODE          □
□   11 1      11     911    1000          L  GEOMETRY TO HOUSING NODE          □
□   12 1      12     912    1000          L  GEOMETRY TO HOUSING NODE          □
□   13 1      13     613    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   14 1      14     614    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   15 1      15     615    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   16 1      16     616    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   17 1      17     617    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   18 1      18     618    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
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CTRL-F1Import ITAS_NC     ALT-F3AutoMLI   UDC Allowed               PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                   End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

èèè Ctrl:Copyèèèèèèèèèèèèèè ITAS Conductor Data Entry èèèèèèèèèèèèèè ESC:Quit £
□                                                                              □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                       □
□   19 1      19     619    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   20 1      20     620    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   21 1      21     621    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   22 1      22     622    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   23 1      23     623    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   24 1      24     624    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   25 1      25     625    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   26 1      26     626    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   27 1      27     627    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   28 1      28     628    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   29 1      29     629    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   30 1      30     630    1000          L  GEOMETRY TO PCB1 THERMAL LAYER    □
□   31 1      31     601    1000          L  GEOMETRY TO TOP PCB THERMAL LAYER □
□   32 1      32     602    1000          L  GEOMETRY TO TOP PCB THERMAL LAYER □
□   33 1      33     603    1000          L  GEOMETRY TO TOP PCB THERMAL LAYER □
□   34 1      34     604    1000          L  GEOMETRY TO TOP PCB THERMAL LAYER □
□   35 1      35     605    1000          L  GEOMETRY TO TOP PCB THERMAL LAYER □
□   36 1      36     606    1000          L  GEOMETRY TO TOP PCB THERMAL LAYER □
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CTRL-F1Import ITAS_NC     ALT-F3AutoMLI   UDC Allowed               PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                   End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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ÈËË Ctrl:CopyËËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From    To      Cond. Value  L/R Description                     º
º   37 1      37      607     1000          L  GEOMETRY TO TOP PCB THERMAL LAYER º
º   38 1      38      608     1000          L  GEOMETRY TO TOP PCB THERMAL LAYER º
º   39 1      39      609     1000          L  GEOMETRY TO TOP PCB THERMAL LAYER º
º   40 1      40      610     1000          L  GEOMETRY TO TOP PCB THERMAL LAYER º
º   41 1      41      611     1000          L  GEOMETRY TO TOP PCB THERMAL LAYER º
º   42 1      42      612     1000          L  GEOMETRY TO TOP PCB THERMAL LAYER º
º   43 1      43      1601    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
º   44 1      44      1602    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
º   45 1      45      1603    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
º   46 1      46      1604    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
º   47 1      47      1605    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
º   48 1      48      1606    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
º   49 1      49      1607    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
º   50 1      50      1608    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
º   51 1      51      1609    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
º   52 1      52      1610    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
º   53 1      53      1611    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
º   54 1      54      1612    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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ÈËË Ctrl:CopyËËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From    To      Cond. Value  L/R Description                     º
º   55 1      55      1613    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
º   56 1      56      1614    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
º   57 1      57      1615    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
º   58 1      58      1616    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
º   59 1      59      1617    1000          L  GEOMETRY TO BOTTOM PCB THERMA LYR º
º   60 1      913     912     178.47        L  EQUIPMENT PLATE TO EPS HOUSING   º
º   61 1      901     905     .26135        L  HOUSING NODES TO HOUSING NODES   º
º   62 1      901     906     1.5333        L  HOUSING NODES TO HOUSING NODES   º
º   63 1      901     911     .27461        L  HOUSING NODES TO HOUSING NODES   º
º   64 1      901     912     1.3563        L  HOUSING NODES TO HOUSING NODES   º
º   65 1      902     903     .60110        L  HOUSING NODES TO HOUSING NODES   º
º   66 1      902     906     .42339        L  HOUSING NODES TO HOUSING NODES   º
º   67 1      902     907     .27461        L  HOUSING NODES TO HOUSING NODES   º
º   68 1      902     912     .42306        L  HOUSING NODES TO HOUSING NODES   º
º   69 1      903     904     .60110        L  HOUSING NODES TO HOUSING NODES   º
º   70 1      903     906     .42306        L  HOUSING NODES TO HOUSING NODES   º
º   71 1      903     912     .42306        L  HOUSING NODES TO HOUSING NODES   º
º   72 1      904     905     .60110        L  HOUSING NODES TO HOUSING NODES   º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
73	1	904	906	.42306	L	HOUSING TO HOUSING NODES
74	1	904	912	.42306	L	HOUSING TO HOUSING NODES
75	1	905	906	.42306	L	HOUSING TO HOUSING NODES
76	1	905	912	.42306	L	HOUSING TO HOUSING NODES
77	1	907	906	13.2667	L	HOUSING TO HOUSING NODES
78	1	907	908	.27461	L	HOUSING TO HOUSING NODES
79	1	907	912	13.2667	L	HOUSING TO HOUSING NODES
80	1	908	906	.42306	L	HOUSING TO HOUSING NODES
81	1	908	910	.60110	L	HOUSING TO HOUSING NODES
82	1	908	912	.42306	L	HOUSING TO HOUSING NODES
83	1	909	906	.42306	L	HOUSING TO HOUSING NODES
84	1	909	910	.60110	L	HOUSING TO HOUSING NODES
85	1	909	912	.42306	L	HOUSING TO HOUSING NODES
86	1	910	906	.42306	L	HOUSING TO HOUSING NODES
87	1	910	911	.60110	L	HOUSING TO HOUSING NODES
88	1	910	912	.42306	L	HOUSING TO HOUSING NODES
89	1	911	906	.42306	L	HOUSING TO HOUSING NODES
90	1	911	912	.42306	L	HOUSING TO HOUSING NODES

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
91	1	921	901	.05856	L	BOTTOM RAIL TO EPS HOUSING (+Y)
92	1	921	907	.05856	L	BOTTOM RAIL TO EPS HOUSING (+Y)
93	1	921	902	11.2443	L	BOTTOM RAIL TO EPS HOUSING (+Y)
94	1	921	903	11.2443	L	BOTTOM RAIL TO EPS HOUSING (+Y)
95	1	921	904	11.2443	L	BOTTOM RAIL TO EPS HOUSING (+Y)
96	1	921	905	11.2443	L	BOTTOM RAIL TO EPS HOUSING (+Y)
97	1	921	906	4.31	L	BOTTOM RAIL TO EPS HOUSING (+Y)
98	1	922	901	.08784	L	MIDDLE RAIL TO EPS HOUSING (+Y)
99	1	922	907	.08784	L	MIDDLE RAIL TO EPS HOUSING (+Y)
100	1	922	902	16.8760	L	MIDDLE RAIL TO EPS HOUSING (+Y)
101	1	922	903	16.8760	L	MIDDLE RAIL TO EPS HOUSING (+Y)
102	1	922	904	16.8760	L	MIDDLE RAIL TO EPS HOUSING (+Y)
103	1	922	905	16.8760	L	MIDDLE RAIL TO EPS HOUSING (+Y)
104	1	923	901	.04661	L	TOP RAIL TO EPS HOUSING (+Y)
105	1	923	907	.04661	L	TOP RAIL TO EPS HOUSING (+Y)
106	1	923	902	8.19666	L	TOP RAIL TO EPS HOUSING (+Y)
107	1	923	903	8.95905	L	TOP RAIL TO EPS HOUSING (+Y)
108	1	923	904	8.95905	L	TOP RAIL TO EPS HOUSING (+Y)

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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¤                                                                                ¤
¤ SqNo FACTOR From    To      Cond. Value   L/R Description                      ¤
¤  109 1      923     905     8.19666        L  TOP RAIL TO EPS HOUSING (+Y)     ¤
¤  110 1      923     906     3.43076        L  TOP RAIL TO EPS HOUSING (+Y)     ¤
¤  111 1      924     901     .05856         L  BOTTOM RAIL TO EPS HOUSING (-Y)  ¤
¤  112 1      924     907     .05856         L  BOTTOM RAIL TO EPS HOUSING (-Y)  ¤
¤  113 1      924     908     11.2443        L  BOTTOM RAIL TO EPS HOUSING (-Y)  ¤
¤  114 1      924     909     11.2443        L  BOTTOM RAIL TO EPS HOUSING (-Y)  ¤
¤  115 1      924     910     11.2443        L  BOTTOM RAIL TO EPS HOUSING (-Y)  ¤
¤  116 1      924     911     11.2443        L  BOTTOM RAIL TO EPS HOUSING (-Y)  ¤
¤  117 1      924     912     4.31           L  BOTTOM RAIL TO EPS HOUSING (-Y)  ¤
¤  118 1      925     901     .08784         L  MIDDLE RAIL TO EPS HOUSING (-Y)  ¤
¤  119 1      925     907     .08784         L  MIDDLE RAIL TO EPS HOUSING (-Y)  ¤
¤  120 1      925     908     16.8760        L  MIDDLE RAIL TO EPS HOUSING (-Y)  ¤
¤  121 1      925     909     16.8760        L  MIDDLE RAIL TO EPS HOUSING (-Y)  ¤
¤  122 1      925     910     16.8760        L  MIDDLE RAIL TO EPS HOUSING (-Y)  ¤
¤  123 1      925     911     16.8760        L  MIDDLE RAIL TO EPS HOUSING (-Y)  ¤
¤  124 1      926     901     .04661         L  TOP RAIL TO EPS HOUSING (-Y)     ¤
¤  125 1      926     907     .04661         L  TOP RAIL TO EPS HOUSING (-Y)     ¤
¤  126 1      926     908     8.19666        L  TOP RAIL TO EPS HOUSING (-Y)     ¤
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed               PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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èëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
¤                                                                                ¤
¤ SqNo FACTOR From    To      Cond. Value   L/R Description                      ¤
¤  127 1      926     909     8.95905        L  TOP RAIL TO EPS HOUSING (-Y)     ¤
¤  128 1      926     910     8.95905        L  TOP RAIL TO EPS HOUSING (-Y)     ¤
¤  129 1      926     911     8.19666        L  TOP RAIL TO EPS HOUSING (-Y)     ¤
¤  130 1      926     912     3.43076        L  TOP RAIL TO EPS HOUSING (-Y)     ¤
¤  131 1      1601    924     .85144         L  BOTTOM PCB Cu LYR TO BTM RL (-Y) ¤
¤  132 1      1602    924     1.3282         L  BOTTOM PCB Cu LYR TO BTM RL (-Y) ¤
¤  133 1      1603    924     .95701         L  BOTTOM PCB Cu LYR TO BTM RL (-Y) ¤
¤  134 1      1604    924     1.1171         L  BOTTOM PCB Cu LYR TO BTM RL (-Y) ¤
¤  135 1      1605    924     .42572         L  BOTTOM PCB Cu LYR TO BTM RL (-Y) ¤
¤  136 1      1606    924     2.12859        L  BOTTOM PCB Cu LYR TO BTM RL (-Y) ¤
¤  137 1      1617    924     .85144         L                                   ¤
¤  138 1      1601    921     .85144         L  BOTTOM PCB Cu LYR TO BTM RL (+Y) ¤
¤  139 1      1614    921     1.32824        L  BOTTOM PCB Cu LYR TO BTM RL (+Y) ¤
¤  140 1      1615    921     2.0741         L  BOTTOM PCB Cu LYR TO BTM RL (+Y) ¤
¤  141 1      1616    921     2.55430        L  BOTTOM PCB Cu LYR TO BTM RL (+Y) ¤
¤  142 1      1617    921     .85144         L  BOTTOM PCB Cu LYR TO BTM RL (+Y) ¤
¤  143 1      1101    925     .05918         L  BTM PCB POLY LYR TO MID RL (-Y)  ¤
¤  144 1      1102    925     .09233         L  BTM PCB POLY LYR TO MID RL (-Y)  ¤
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed               PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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Ctrl:Copy                ITAS Conductor Data Entry                ESC:Quit
 SqNo FACTOR From   To     Cond. Value  L/R Description
  145 1      1103   925    .06652        L  BTM PCB POLY LYR TO MID RL (-Y)
  146 1      1104   925    .07765        L  BTM PCB POLY LYR TO MID RL (-Y)
  147 1      1105   925    .02959        L  BTM PCB POLY LYR TO MID RL (-Y)
  148 1      1106   925    .14796        L  BTM PCB POLY LYR TO MID RL (-Y)
  149 1      1117   925    .059184       L  BTM PCB POLY LYR TO MID RL (-Y)
  150 1      1101   922    .059184       L  BTM PCB POLY LYR TO MID RL (+Y)
  151 1      1114   922    .092328       L  BTM PCB POLY LYR TO MID RL (+Y)
  152 1      1115   922    .144173       L  BTM PCB POLY LYR TO MID RL (+Y)
  153 1      1116   922    .177553       L  BTM PCB POLY LYR TO MID RL (+Y)
  154 1      1117   922    .059184       L  BTM PCB POLY LYR TO MID RL (+Y)
  155 1      601    925    1.11579       L  TOP PCB Cu LYR TO MID RL (-Y)
  156 1      602    925    1.52147       L  TOP PCB Cu LYR TO MID RL (-Y)
  157 1      603    925    .405689       L  TOP PCB Cu LYR TO MID RL (-Y)
  158 1      604    925    1.62273       L  TOP PCB Cu LYR TO MID RL (-Y)
  159 1      605    925    .405689       L  TOP PCB Cu LYR TO MID RL (-Y)
  160 1      606    925    2.23125       L  TOP PCB Cu LYR TO MID RL (-Y)
  161 1      625    922    2.23125       L  TOP PCB Cu LYR TO MID RL (+Y)
  162 1      626    922    1.11579       L  TOP PCB Cu LYR TO MID RL (+Y)
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

Ctrl:Copy                ITAS Conductor Data Entry                ESC:Quit
 SqNo FACTOR From   To     Cond. Value  L/R Description
  163 1      627    922    1.11579       L  TOP PCB Cu LYR TO MID RL (+Y)
  164 1      628    922    1.11579       L  TOP PCB Cu LYR TO MID RL (+Y)
  165 1      629    922    1.11579       L  TOP PCB Cu LYR TO MID RL (+Y)
  166 1      630    922    2.23125       L  TOP PCB Cu LYR TO MID RL (+Y)
  167 1      101    926    .08179        L  TOP PCB POLY LYR TO MID RL (-Y)
  168 1      102    926    .11152        L  TOP PCB POLY LYR TO MID RL (-Y)
  169 1      103    926    .02974        L  TOP PCB POLY LYR TO MID RL (-Y)
  170 1      104    926    .11894        L  TOP PCB POLY LYR TO MID RL (-Y)
  171 1      105    926    .02974        L  TOP PCB POLY LYR TO MID RL (-Y)
  172 1      106    926    .16355        L  TOP PCB POLY LYR TO MID RL (-Y)
  173 1      125    923    .16355        L  TOP PCB POLY LYR TO TOP RL (+Y)
  174 1      126    923    .08179        L  TOP PCB POLY LYR TO TOP RL (+Y)
  175 1      127    923    .08179        L  TOP PCB POLY LYR TO TOP RL (+Y)
  176 1      128    923    .08179        L  TOP PCB POLY LYR TO TOP RL (+Y)
  177 1      129    923    .08179        L  TOP PCB POLY LYR TO TOP RL (+Y)
  178 1      130    923    .16355        L  TOP PCB POLY LYR TO TOP RL (+Y)
  179 1      601    602    .018635       L  TOP PCB THERMAL LAYER NODE-NODE
  180 1      601    607    .006764       L
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
181	1	602	603	.025866	L	TOP PCB THERMAL LYR NODE-NODE
182	1	602	608	.092383	L	
183	1	603	604	.02423	L	
184	1	603	609	.002573	L	
185	1	604	605	.02457	L	
186	1	604	610	.009852	L	
187	1	605	606	.018635	L	
188	1	605	611	.00257	L	
189	1	606	612	.013565	L	
190	1	607	608	.02286	L	
191	1	607	613	.009630	L	
192	1	608	609	.019815	L	
193	1	608	613	.002617	L	
194	1	608	614	.009630	L	
195	1	608	615	.04057	L	
196	1	609	610	.02972	L	
197	1	609	615	.003664	L	
198	1	610	611	.02972	L	

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
199	1	610	615	.005234	L	TOP PCB THRML LYR NODE-NODE
200	1	610	616	.008793	L	
201	1	611	612	.022863	L	
202	1	611	616	.008793	L	
203	1	611	617	.002617	L	
204	1	612	617	.007013	L	
205	1	612	618	.01230	L	
206	1	613	614	.007164	L	
207	1	613	619	.024189	L	
208	1	614	615	.008141	L	
209	1	614	620	.018940	L	
210	1	615	616	.008141	L	
211	1	615	621	.01832	L	
212	1	616	617	.008141	L	
213	1	616	622	.018940	L	
214	1	617	618	.007164	L	
215	1	617	623	.018940	L	
216	1	618	624	.010293	L	

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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□                                                                               □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                      □
□  217 1      619     620     .008770       L  TOP PCB THERMAL LYR NODE-NODE    □
□  218 1      619     625     .023410       L                                   □
□  219 1      620     621     .009967       L                                   □
□  220 1      620     625     .018329       L                                   □
□  221 1      621     622     .009967       L                                   □
□  222 1      621     627     .017731       L                                   □
□  223 1      622     623     .014145       L                                   □
□  224 1      622     628     .012913       L                                   □
□  225 1      623     624     .008770       L                                   □
□  226 1      623     629     .018324       L                                   □
□  227 1      624     630     .009961       L                                   □
□  228 1      625     626     .010684       L                                   □
□  229 1      626     627     .012141       L                                   □
□  230 1      627     628     .012141       L                                   □
□  231 1      628     629     .012141       L                                   □
□  232 1      629     630     .010684       L                                   □
□  233 1      501     502     .005651       L  TOP PCB LOWEST POLY LYR NODE-NODE □
□  234 1      501     507     .002025       L                                   □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur               End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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□                                                                               □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                      □
□  235 1      502     503     .005650       L  TOP PCB BTM POLY LYR NODE-NODE   □
□  236 1      502     508     .002025       L                                   □
□  237 1      503     504     .007733       L                                   □
□  238 1      503     509     .002761       L                                   □
□  239 1      504     505     .007346       L                                   □
□  240 1      504     510     .007364       L                                   □
□  241 1      505     506     .007346       L                                   □
□  242 1      505     511     .002946       L                                   □
□  243 1      506     512     .005650       L                                   □
□  244 1      507     508     .007364       L                                   □
□  245 1      507     513     .004050       L                                   □
□  246 1      508     509     .006839       L                                   □
□  247 1      508     513     .004488       L                                   □
□  248 1      508     514     .009359       L                                   □
□  249 1      508     515     .001224       L                                   □
□  250 1      509     510     .004488       L                                   □
□  251 1      509     515     .0004087      L                                   □
□  252 1      510     511     .008891       L                                   □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur               End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                     □
□  253 1      510     515     .002449       L  TOP PCB BTM POLY LYR NODE-NODE  □
□  254 1      510     516     .004080       L                                  □
□  255 1      511     512     .006839       L                                  □
□  256 1      511     516     .004080       L                                  □
□  257 1      511     517     .001224       L                                  □
□  258 1      512     517     .003264       L                                  □
□  259 1      512     518     .005712       L                                  □
□  260 1      513     514     .002018       L                                  □
□  261 1      513     519     .007217       L                                  □
□  262 1      514     515     .002285       L                                  □
□  263 1      514     520     .005670       L                                  □
□  264 1      515     516     .002284       L                                  □
□  265 1      515     521     .005670       L                                  □
□  266 1      516     517     .002285       L                                  □
□  267 1      516     522     .005670       L                                  □
□  268 1      517     518     .002010       L                                  □
□  269 1      517     523     .005670       L                                  □
□  270 1      518     524     .007217       L                                  □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                     □
□  271 1      519     520     .002629       L  TOP PCB BTM POLY LYR NODE-NODE  □
□  272 1      519     525     .006984       L                                  □
□  273 1      520     521     .002988       L                                  □
□  274 1      520     526     .005487       L                                  □
□  275 1      521     522     .002988       L                                  □
□  276 1      521     527     .005487       L                                  □
□  277 1      522     523     .002988       L                                  □
□  278 1      522     528     .005487       L                                  □
□  279 1      523     524     .002629       L                                  □
□  280 1      523     529     .005487       L                                  □
□  281 1      525     526     .002164       L                                  □
□  282 1      526     527     .002460       L                                  □
□  283 1      527     528     .002460       L                                  □
□  284 1      528     529     .002460       L                                  □
□  285 1      529     530     .002164       L                                  □
□  286 1      401     402     .018902       L  TOP PCB GRND LYR NODE-NODE      □
□  287 1      401     407     .006764       L                                  □
□  288 1      402     403     .025866       L                                  □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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ÈËËË Ctrl:CopyËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From    To      Cond. Value  L/R Description                     º
º  289 1      402     408     .09238        L  TOP PCB GRND LYR NODE-NODE     º
º  290 1      403     404     .02422        L                                 º
º  291 1      403     409     .00257        L                                 º
º  292 1      404     405     .02457        L                                 º
º  293 1      404     410     .009852       L                                 º
º  294 1      405     406     .01863        L                                 º
º  295 1      405     411     .002573       L                                 º
º  296 1      406     412     .013565       L                                 º
º  297 1      407     408     .02286        L                                 º
º  298 1      407     413     .009630       L                                 º
º  299 1      408     409     .01981        L                                 º
º  300 1      408     413     .002617       L                                 º
º  301 1      408     414     .009630       L                                 º
º  302 1      408     415     .04056        L                                 º
º  303 1      409     410     .02972        L                                 º
º  304 1      409     415     .003664       L                                 º
º  305 1      410     411     .029722       L                                 º
º  306 1      410     415     .005234       L                                 º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ÈËËË Ctrl:CopyËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From    To      Cond. Value  L/R Description                     º
º  307 1      410     416     .008793       L  TOP PCB GRND LYR NODE-NODE     º
º  308 1      411     412     .022863       L                                 º
º  309 1      411     416     .008793       L                                 º
º  310 1      411     417     .002617       L                                 º
º  311 1      412     417     .007013       L                                 º
º  312 1      412     418     .01230        L                                 º
º  313 1      413     414     .007164       L                                 º
º  314 1      413     419     .024189       L                                 º
º  315 1      414     415     .008141       L                                 º
º  316 1      414     420     .018940       L                                 º
º  317 1      415     416     .008141       L                                 º
º  318 1      415     421     .018322       L                                 º
º  319 1      416     417     .008141       L                                 º
º  320 1      416     422     .018940       L                                 º
º  321 1      417     418     .007164       L                                 º
º  322 1      417     423     .018940       L                                 º
º  323 1      418     424     .010293       L                                 º
º  324 1      419     420     .008770       L                                 º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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ÈËË Ctrl:CopyËËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From   To     Cond. Value  L/R Description                       º
º  325 1      419    425    .02341        L  TOP PCB GRND LYR NODE-NODE       º
º  326 1      420    421    .009966       L                                   º
º  327 1      420    426    .018329       L                                   º
º  328 1      421    422    .009966       L                                   º
º  329 1      421    427    .017731       L                                   º
º  330 1      422    423    .014145       L                                   º
º  331 1      422    428    .012913       L                                   º
º  332 1      423    424    .008770       L                                   º
º  333 1      423    429    .018329       L                                   º
º  334 1      424    430    .009961       L                                   º
º  335 1      425    426    .01068        L                                   º
º  336 1      426    427    .01214        L                                   º
º  337 1      427    428    .01214        L                                   º
º  338 1      428    429    .01214        L                                   º
º  339 1      429    430    .01068        L                                   º
º  340 1      301    302    .005650       L  TOP PCB MID POLY LYR NODE-NODE   º
º  341 1      301    307    .002025       L                                   º
º  342 1      302    303    .007733       L                                   º
ÈËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÍ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ÈËË Ctrl:CopyËËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From   To     Cond. Value  L/R Description                       º
º  343 1      302    308    .002761       L  TOP PCB MID POLY LYR NODE-NODE   º
º  344 1      303    304    .007346       L                                   º
º  345 1      303    309    .007364       L                                   º
º  346 1      304    305    .007346       L                                   º
º  347 1      304    310    .002946       L                                   º
º  348 1      305    306    .005650       L                                   º
º  349 1      305    311    .007364       L                                   º
º  350 1      306    312    .004050       L                                   º
º  351 1      307    308    .006840       L                                   º
º  352 1      307    313    .004488       L                                   º
º  353 1      308    309    .009359       L                                   º
º  354 1      308    313    .001224       L                                   º
º  355 1      308    314    .004488       L                                   º
º  356 1      308    315    .000408       L                                   º
º  357 1      309    310    .008991       L                                   º
º  358 1      309    315    .016321       L                                   º
º  359 1      310    311    .00889        L                                   º
º  360 1      310    315    .002449       L                                   º
ÈËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÍ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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ÈËË Ctrl:CopyËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From   To     Cond. Value  L/R Description                       º
º  361 1      310    316    .004080       L  TOP PCB MID POLY LAYER NODE-NODE  º
º  362 1      311    312    .006840       L                                    º
º  363 1      311    316    .004080       L                                    º
º  364 1      311    317    .001224       L                                    º
º  365 1      312    317    .003264       L                                    º
º  366 1      312    318    .005712       L                                    º
º  367 1      313    314    .002018       L                                    º
º  368 1      313    319    .007217       L                                    º
º  369 1      314    315    .002285       L                                    º
º  370 1      314    320    .005670       L                                    º
º  371 1      315    316    .002285       L                                    º
º  372 1      315    321    .005670       L                                    º
º  373 1      316    317    .002285       L                                    º
º  374 1      316    322    .005670       L                                    º
º  375 1      317    318    .002010       L                                    º
º  376 1      317    323    .005670       L                                    º
º  377 1      318    324    .0007217      L                                    º
º  378 1      319    320    .002629       L                                    º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ÈËË Ctrl:CopyËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From   To     Cond. Value  L/R Description                       º
º  379 1      319    325    .006984       L  TOP PCB MID POLY LYR NODE-NODE    º
º  380 1      320    321    .002988       L                                    º
º  381 1      320    326    .005487       L                                    º
º  382 1      321    322    .002988       L                                    º
º  383 1      321    327    .005487       L                                    º
º  384 1      322    323    .002988       L                                    º
º  385 1      322    328    .005487       L                                    º
º  386 1      323    324    .002629       L                                    º
º  387 1      323    329    .005487       L                                    º
º  388 1      324    330    .06984        L                                    º
º  389 1      325    326    .002164       L                                    º
º  390 1      326    327    .002460       L                                    º
º  391 1      327    328    .002460       L                                    º
º  392 1      328    329    .002460       L                                    º
º  393 1      329    330    .002164       L                                    º
º  394 1      201    202    .018902       L  TOP PCB TOP Cu LYR NODE-NODE      º
º  395 1      201    207    .006764       L                                    º
º  396 1      202    203    .025866       L                                    º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
397	1	202	208	.09238	L	TOP PCB TOP Cu LYR NODE-NODE
398	1	203	2045	.02423	L	
399	1	203	209	.002573	L	
400	1	204	205	.02457	L	
401	1	204	210	.00985	L	
402	1	205	206	.01863	L	
403	1	205	211	.002573	L	
404	1	206	212	.013565	L	
405	1	207	208	.022863	L	
406	1	207	213	.009630	L	
407	1	208	209	.01981	L	
408	1	208	213	.002670	L	
409	1	208	214	.009630	L	
410	1	208	215	.04056	L	
411	1	209	210	.02972	L	
412	1	209	215	.003663	L	
413	1	210	211	.02972	L	
414	1	210	215	.005234	L	

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
415	1	210	216	.008793	L	TOP PCB TOP Cu LYR NODE-NODE
416	1	211	212	.02286	L	
417	1	211	216	.008793	L	
418	1	211	217	.0026170	L	
419	1	212	217	.0070134	L	
420	1	212	218	.001230	L	
421	1	213	214	.0071641	L	
422	1	213	219	.024190	L	
423	1	214	215	.008141	L	
424	1	214	220	.018940	L	
425	1	215	216	.0081410	L	
426	1	215	221	.018322	L	
427	1	216	217	.0189397	L	
428	1	216	222	.018940	L	
429	1	217	218	.007164	L	
430	1	217	223	.0018940	L	
431	1	218	224	.010293	L	
432	1	219	220	.008770	L	

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
433	1	219	225	.02341	L	TOP PCB TOP Cu LYR NODE-NODE
434	1	220	221	.009966	L	
435	1	220	226	.018329	L	
436	1	221	222	.009966	L	
437	1	221	227	.017731	L	
438	1	222	223	.014145	L	
439	1	222	228	.01291	L	
440	1	223	224	.008770	L	
441	1	223	229	.018329	L	
442	1	224	230	.009961	L	
443	1	225	226	.010684	L	
444	1	226	227	.012141	L	
445	1	227	228	.012141	L	
446	1	228	229	.012141	L	
447	1	229	230	.010684	L	
448	1	101	102	.005650	L	TOP PCB TOP POLY LYR NODE-NODE
449	1	101	107	.002025	L	
450	1	102	103	.007733	L	

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
451	1	102	108	.002761	L	TOP PCB TOP POLY LYR NODE-NODE
452	1	103	104	.0073456	L	
453	1	103	109	.0073638	L	
454	1	104	105	.007346	L	
455	1	104	110	.0029455	L	
456	1	105	106	.005650	L	
457	1	105	111	.0073638	L	
458	1	106	112	.004050	L	
459	1	107	108	.006839	L	
460	1	107	113	.004488	L	
461	1	108	109	.009359	L	
462	1	108	113	.001224	L	
463	1	108	114	.004488	L	
464	1	108	115	.0004087	L	
465	1	109	110	.0088991	L	
466	1	109	115	.01632	L	
467	1	110	111	.008891	L	
468	1	110	115	.002449	L	

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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ÈËË Ctrl:CopyËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit £
¤                                                                          ¤
¤ SqNo FACTOR From   To     Cond. Value  L/R Description                    ¤
¤  469 1      110    116    .004080       L  TOP PCB TOP POLY LYR NODE-NODE ¤
¤  470 1      111    112    .006839       L                                 ¤
¤  471 1      111    116    .004080       L                                 ¤
¤  472 1      111    117    .001224       L                                 ¤
¤  473 1      112    117    .032642       L                                 ¤
¤  474 1      112    118    .005712       L                                 ¤
¤  475 1      113    114    .002018       L                                 ¤
¤  476 1      113    119    .007217       L                                 ¤
¤  477 1      114    115    .002285       L                                 ¤
¤  478 1      114    120    .005670       L                                 ¤
¤  479 1      115    116    .002285       L                                 ¤
¤  480 1      115    621    .005670       L                                 ¤
¤  481 1      116    117    .002845       L                                 ¤
¤  482 1      116    122    .005670       L                                 ¤
¤  483 1      117    118    .002010       L                                 ¤
¤  484 1      117    123    .005670       L                                 ¤
¤  485 1      118    124    .007217       L                                 ¤
¤  486 1      119    120    .002629       L                                 ¤
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ÈËË Ctrl:CopyËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit £
¤                                                                          ¤
¤ SqNo FACTOR From   To     Cond. Value  L/R Description                    ¤
¤  487 1      119    125    .006984       L  TOP PCB TOP POLY LYR NODE-NODE ¤
¤  488 1      120    121    .002988       L                                 ¤
¤  489 1      120    126    .005487       L                                 ¤
¤  490 1      121    122    .002988       L                                 ¤
¤  491 1      121    127    .005487       L                                 ¤
¤  492 1      122    123    .002988       L                                 ¤
¤  493 1      122    128    .005487       L                                 ¤
¤  494 1      123    124    .002629       L                                 ¤
¤  495 1      123    129    .005487       L                                 ¤
¤  496 1      124    130    .006984       L                                 ¤
¤  497 1      125    126    .002164       L                                 ¤
¤  498 1      126    127    .002460       L                                 ¤
¤  499 1      127    128    .002460       L                                 ¤
¤  500 1      128    129    .002460       L                                 ¤
¤  501 1      129    130    .000164       L                                 ¤
¤  502 1      601    501    .625          L  TOP PCB LAYER 6XX TO 5XX       ¤
¤  503 1      602    502    .85227        L  TOP PCB LAYER 6XX TO 5XX       ¤
¤  504 1      603    503    .22727        L  TOP PCB LAYER 6XX TO 5XX       ¤
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
505	1	604	504	.90909	L	TOP PCB LAYER 6XX TO 5XX
506	1	605	505	.90909	L	TOP PCB LAYER 6XX TO 5XX
507	1	606	506	1.2450	L	TOP PCB LAYER 6XX TO 5XX
508	1	607	507	.75655	L	TOP PCB LAYER 6XX TO 5XX
509	1	608	508	1.03177	L	TOP PCB LAYER 6XX TO 5XX
510	1	609	509	.27512	L	TOP PCB LAYER 6XX TO 5XX
511	1	610	510	1.10048	L	TOP PCB LAYER 6XX TO 5XX
512	1	611	511	1.10048	L	TOP PCB LAYER 6XX TO 5XX
513	1	612	512	1.51311	L	TOP PCB LAYER 6XX TO 5XX
514	1	613	513	.02720	L	TOP PCB LAYER 6XX TO 5XX
515	1	614	514	.21378	L	TOP PCB LAYER 6XX TO 5XX
516	1	615	515	.21378	L	TOP PCB LAYER 6XX TO 5XX
517	1	616	516	.21378	L	TOP PCB LAYER 6XX TO 5XX
518	1	617	517	.21378	L	TOP PCB LAYER 6XX TO 5XX
519	1	618	518	.27197	L	TOP PCB LAYER 6XX TO 5XX
520	1	619	519	.35579	L	TOP PCB LAYER 6XX TO 5XX
521	1	620	520	.27962	L	TOP PCB LAYER 6XX TO 5XX
522	1	621	521	.27962	L	TOP PCB LAYER 6XX TO 5XX

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
523	1	622	522	.27962	L	TOP PCB LAYER 6XX TO 5XX
524	1	623	523	.27962	L	TOP PCB LAYER 6XX TO 5XX
525	1	624	524	.35579	L	TOP PCB LAYER 6XX TO 5XX
526	1	625	525	.29301	L	TOP PCB LAYER 6XX TO 5XX
527	1	626	526	.23024	L	TOP PCB LAYER 6XX TO 5XX
528	1	627	527	.23024	L	TOP PCB LAYER 6XX TO 5XX
529	1	628	528	.23024	L	TOP PCB LAYER 6XX TO 5XX
530	1	629	529	.23024	L	TOP PCB LAYER 6XX TO 5XX
531	1	630	530	.29301	L	TOP PCB LAYER 6XX TO 5XX
532	1	501	401	.62509	L	TOP PCB LAYER 5XX TO 4XX
533	1	502	402	.85227	L	TOP PCB LAYER 5XX TO 4XX
534	1	503	403	.22727	L	TOP PCB LAYER 5XX TO 4XX
535	1	504	404	.90909	L	TOP PCB LAYER 5XX TO 4XX
536	1	505	405	.90909	L	TOP PCB LAYER 5XX TO 4XX
537	1	506	406	1.25	L	TOP PCB LAYER 5XX TO 4XX
538	1	507	407	.75655	L	TOP PCB LAYER 5XX TO 4XX
539	1	508	408	1.03177	L	TOP PCB LAYER 5XX TO 4XX
540	1	509	409	.27512	L	TOP PCB LAYER 5XX TO 4XX

CTRL-F1Import ITAS_NC   ALT-F3AutoMLI   UDC Allowed   PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur   End
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
541	1	510	410	1.10047	L	TOP PCB LAYER 5XX TO 4XX
542	1	511	411	1.10047	L	TOP PCB LAYER 5XX TO 4XX
543	1	512	412	1.51311	L	TOP PCB LAYER 5XX TO 4XX
544	1	513	413	.27196	L	TOP PCB LAYER 5XX TO 4XX
545	1	514	414	.21378	L	TOP PCB LAYER 5XX TO 4XX
546	1	515	415	.21378	L	TOP PCB LAYER 5XX TO 4XX
547	1	516	416	.21378	L	TOP PCB LAYER 5XX TO 4XX
548	1	517	417	.21378	L	TOP PCB LAYER 5XX TO 4XX
549	1	518	418	.27196	L	TOP PCB LAYER 5XX TO 4XX
550	1	519	419	.35579	L	TOP PCB LAYER 5XX TO 4XX
551	1	520	420	.27962	L	TOP PCB LAYER 5XX TO 4XX
552	1	521	421	.27962	L	TOP PCB LAYER 5XX TO 4XX
553	1	522	422	.27962	L	TOP PCB LAYER 5XX TO 4XX
554	1	523	423	.27962	L	TOP PCB LAYER 5XX TO 4XX
555	1	524	424	.35579	L	TOP PCB LAYER 5XX TO 4XX
556	1	525	425	.29301	L	TOP PCB LAYER 5XX TO 4XX
557	1	526	426	.23024	L	TOP PCB LAYER 5XX TO 4XX
558	1	527	427	.23024	L	TOP PCB LAYER 5XX TO 4XX

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
559	1	528	428	.23024	L	TOP PCB LAYER 5XX TO 4XX
560	1	529	429	.23024	L	TOP PCB LAYER 5XX TO 4XX
561	1	530	430	.29301	L	TOP PCB LAYER 5XX TO 4XX
562	1	401	301	.625	L	TOP PCB LAYER 4XX TO 3XX
563	1	402	302	.85227	L	TOP PCB LAYER 4XX TO 3XX
564	1	403	303	.22727	L	TOP PCB LAYER 4XX TO 3XX
565	1	404	304	.90909	L	TOP PCB LAYER 4XX TO 3XX
566	1	405	305	.90909	L	TOP PCB LAYER 4XX TO 3XX
567	1	406	306	1.25	L	TOP PCB LAYER 4XX TO 3XX
568	1	407	307	.75655	L	TOP PCB LAYER 4XX TO 3XX
569	1	408	308	1.03177	L	TOP PCB LAYER 4XX TO 3XX
570	1	409	309	.27512	L	TOP PCB LAYER 4XX TO 3XX
571	1	410	310	1.10048	L	TOP PCB LAYER 4XX TO 3XX
572	1	411	311	1.10048	L	TOP PCB LAYER 4XX TO 3XX
573	1	412	312	1.51311	L	TOP PCB LAYER 4XX TO 3XX
574	1	413	313	.27196	L	TOP PCB LAYER 4XX TO 3XX
575	1	414	314	.21378	L	TOP PCB LAYER 4XX TO 3XX
576	1	415	315	.21378	L	TOP PCB LAYER 4XX TO 3XX

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
577	1	416	316	.21378	L	TOP PCB LAYER 4XX TO 3XX
578	1	417	317	.21378	L	TOP PCB LAYER 4XX TO 3XX
579	1	418	318	.27196	L	TOP PCB LAYER 4XX TO 3XX
580	1	419	319	.27196	L	TOP PCB LAYER 4XX TO 3XX
581	1	420	320	.35579	L	TOP PCB LAYER 4XX TO 3XX
582	1	421	321	.27196	L	TOP PCB LAYER 4XX TO 3XX
583	1	422	322	.27196	L	TOP PCB LAYER 4XX TO 3XX
584	1	423	323	.27196	L	TOP PCB LAYER 4XX TO 3XX
585	1	424	324	.90909	L	TOP PCB LAYER 4XX TO 3XX
586	1	425	325	.35579	L	TOP PCB LAYER 4XX TO 3XX
587	1	426	326	.29301	L	TOP PCB LAYER 4XX TO 3XX
588	1	427	327	.23024	L	TOP PCB LAYER 4XX TO 3XX
589	1	428	328	.23024	L	TOP PCB LAYER 4XX TO 3XX
590	1	429	329	.23024	L	TOP PCB LAYER 4XX TO 3XX
591	1	430	330	.29301	L	TOP PCB LAYER 4XX TO 3XX
592	1	301	201	.625	L	TOP PCB LAYER 3XX TO 2XX
593	1	302	202	.85227	L	TOP PCB LAYER 3XX TO 2XX
594	1	303	203	.22727	L	TOP PCB LAYER 3XX TO 2XX

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
595	1	304	204	.90909	L	TOP PCB LAYER 3XX TO 2XX
596	1	305	205	.90909	L	TOP PCB LAYER 3XX TO 2XX
597	1	306	206	1.25	L	TOP PCB LAYER 3XX TO 2XX
598	1	307	207	.75655	L	TOP PCB LAYER 3XX TO 2XX
599	1	308	208	1.03177	L	TOP PCB LAYER 3XX TO 2XX
600	1	309	209	.27512	L	TOP PCB LAYER 3XX TO 2XX
601	1	310	210	1.10048	L	TOP PCB LAYER 3XX TO 2XX
602	1	311	211	1.10048	L	TOP PCB LAYER 3XX TO 2XX
603	1	312	212	1.51311	L	TOP PCB LAYER 3XX TO 2XX
604	1	313	213	.27196	L	TOP PCB LAYER 3XX TO 2XX
605	1	314	214	.21378	L	TOP PCB LAYER 3XX TO 2XX
606	1	315	215	.21378	L	TOP PCB LAYER 3XX TO 2XX
607	1	316	216	.21378	L	TOP PCB LAYER 3XX TO 2XX
608	1	317	217	.21378	L	TOP PCB LAYER 3XX TO 2XX
609	1	318	218	.27196	L	TOP PCB LAYER 3XX TO 2XX
610	1	319	219	.35559	L	TOP PCB LAYER 3XX TO 2XX
611	1	320	220	.27196	L	TOP PCB LAYER 3XX TO 2XX
612	1	321	221	.27196	L	TOP PCB LAYER 3XX TO 2XX

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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ÈËË Ctrl:CopyËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From   To     Cond. Value  L/R Description                       º
º  613 1      322    222    .27196        L  TOP PCB LAYER 3XX TO 2XX         º
º  614 1      323    223    .27196        L  TOP PCB LAYER 3XX TO 2XX         º
º  615 1      324    224    .35579        L  TOP PCB LAYER 3XX TO 2XX         º
º  616 1      325    225    .29301        L  TOP PCB LAYER 3XX TO 2XX         º
º  617 1      326    226    .23024        L  TOP PCB LAYER 3XX TO 2XX         º
º  618 1      327    227    .23024        L  TOP PCB LAYER 3XX TO 2XX         º
º  619 1      328    228    .23024        L  TOP PCB LAYER 3XX TO 2XX         º
º  620 1      329    229    .23024        L  TOP PCB LAYER 3XX TO 2XX         º
º  621 1      330    230    .29301        L  TOP PCB LAYER 3XX TO 2XX         º
º  622 1      201    101    .625          L  TOP PCB LAYER 2XX TO1XX          º
º  623 1      202    102    .85227        L  TOP PCB LAYER 2XX TO1XX          º
º  624 1      203    103    .22727        L  TOP PCB LAYER 2XX TO1XX          º
º  625 1      204    104    .90909        L  TOP PCB LAYER 2XX TO1XX          º
º  626 1      205    105    .90909        L  TOP PCB LAYER 2XX TO1XX          º
º  627 1      206    106    1.25          L  TOP PCB LAYER 2XX TO1XX          º
º  628 1      207    107    .75655        L  TOP PCB LAYER 2XX TO1XX          º
º  629 1      208    108    1.03177       L  TOP PCB LAYER 2XX TO1XX          º
º  630 1      209    109    .27512        L  TOP PCB LAYER 2XX TO1XX          º
ÈËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÊ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ÈËË Ctrl:CopyËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From   To     Cond. Value  L/R Description                       º
º  631 1      210    110    1.10048       L  TOP PCB LAYER 2XX TO1XX          º
º  632 1      211    111    1.10048       L  TOP PCB LAYER 2XX TO1XX          º
º  633 1      212    112    1.51311       L  TOP PCB LAYER 2XX TO1XX          º
º  634 1      213    113    .27196        L  TOP PCB LAYER 2XX TO1XX          º
º  635 1      214    114    .21378        L  TOP PCB LAYER 2XX TO1XX          º
º  636 1      215    115    .21378        L  TOP PCB LAYER 2XX TO1XX          º
º  637 1      216    116    .21378        L  TOP PCB LAYER 2XX TO1XX          º
º  638 1      217    117    .21378        L  TOP PCB LAYER 2XX TO1XX          º
º  639 1      218    118    .27196        L  TOP PCB LAYER 2XX TO1XX          º
º  640 1      219    119    .35579        L  TOP PCB LAYER 2XX TO1XX          º
º  641 1      220    120    .27196        L  TOP PCB LAYER 2XX TO1XX          º
º  642 1      221    121    .27196        L  TOP PCB LAYER 2XX TO1XX          º
º  643 1      222    122    .27196        L  TOP PCB LAYER 2XX TO1XX          º
º  644 1      223    123    .27196        L  TOP PCB LAYER 2XX TO1XX          º
º  645 1      224    124    .35579        L  TOP PCB LAYER 2XX TO1XX          º
º  646 1      225    125    .29301        L  TOP PCB LAYER 2XX TO1XX          º
º  647 1      226    126    .23024        L  TOP PCB LAYER 2XX TO1XX          º
º  648 1      227    127    .23024        L  TOP PCB LAYER 2XX TO1XX          º
ÈËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÊ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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□                                                                              □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                      □
□  649 1      228    128    .23024        L  TOP PCB LAYER 2XX TO1XX           □
□  650 1      229    129    .23024        L  TOP PCB LAYER 2XX TO1XX           □
□  651 1      230    130    .29301        L  TOP PCB LAYER 2XX TO1XX           □
□  652 1      1601   1602   .0006276      L  BOTTOM PCB THERMAL LYR NODE-NODE  □
□  653 1      1601   1607   .0003138      L                                    □
□  654 1      1601   1614   .0007322      L                                    □
□  655 1      1602   1603   .0005983      L                                    □
□  656 1      1602   1607   .0002613      L                                    □
□  657 1      1603   1604   .0006597      L                                    □
□  658 1      1603   1608   .0001342      L                                    □
□  659 1      1604   1605   .0008874      L                                    □
□  660 1      1604   1609   .0000524      L                                    □
□  661 1      1604   1610   .0000444      L                                    □
□  662 1      1604   1611   .0000560      L                                    □
□  663 1      1605   1606   .000536       L                                    □
□  664 1      1605   1612   .0000524      L                                    □
□  665 1      1606   1617   .0004594      L                                    □
□  666 1      1606   1613   .0002978      L                                    □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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□                                                                              □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                      □
□  667 1      1607   1608   .0002992      L  BOTTOM PCB THERMAL LYR NODE-NODE  □
□  668 1      1607   1614   .0001861      L                                    □
□  669 1      1608   1609   .0002780      L                                    □
□  670 1      1608   1615   .0001340      L                                    □
□  671 1      1609   1610   .0009901      L                                    □
□  672 1      1609   1615   .0000524      L                                    □
□  673 1      1610   1611   .0009178      L                                    □
□  674 1      1610   1615   .0000444      L                                    □
□  675 1      1611   1612   .000804       L                                    □
□  676 1      1611   1615   .0000560      L                                    □
□  677 1      1612   1613   .000268       L                                    □
□  678 1      1612   1616   .0000596      L                                    □
□  679 1      1613   1617   .0003829      L                                    □
□  680 1      1613   1616   .0003752      L                                    □
□  681 1      1614   1615   .000469       L                                    □
□  682 1      1615   1616   .0003450      L                                    □
□  683 1      1616   1617   .000469       L                                    □
□  684 1      1501   1502   .009055       L  BOTTOM PCB BTM POLY LYR NODE-NODE □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

```
ÈËË Ctrl:CopyËËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From   To     Cond. Value  L/R Description                        º
º  685 1      1501   1507   .004528       L  BOTTOM PCB BTM POLY LYR NODE-NODE º
º  686 1      1501   1514   .010570       L                                    º
º  687 1      1502   1503   .008631       L                                    º
º  688 1      1502   1507   .002684       L                                    º
º  689 1      1503   1504   .009516       L                                    º
º  690 1      1503   1508   .001929       L                                    º
º  691 1      1504   1505   .01280        L                                    º
º  692 1      1504   1509   .000752       L                                    º
º  693 1      1504   1510   .000644       L                                    º
º  694 1      1504   1511   .000860       L                                    º
º  695 1      1505   1506   .007733       L                                    º
º  696 1      1505   1512   .000860       L                                    º
º  697 1      1506   1517   .006629       L                                    º
º  698 1      1506   1513   .004293       L                                    º
º  699 1      1507   1508   .004315       L                                    º
º  700 1      1507   1514   .002416       L                                    º
º  701 1      1508   1509   .004033       L                                    º
º  702 1      1508   1515   .00232        L                                    º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ÈËË Ctrl:CopyËËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From   To     Cond. Value  L/R Description                        º
º  703 1      1509   1510   .01429        L  BOTTOM PCB BTM POLY LYR NODE-NODE º
º  704 1      1509   1515   .000691       L                                    º
º  705 1      1510   1511   .01324        L                                    º
º  706 1      1510   1515   .00058        L                                    º
º  707 1      1511   1512   .0116         L                                    º
º  708 1      1511   1516   .000774       L                                    º
º  709 1      1512   1513   .003867       L                                    º
º  710 1      1512   1516   .000774       L                                    º
º  711 1      1513   1517   .003314       L                                    º
º  712 1      1513   1516   .003864       L                                    º
º  713 1      1514   1515   .00677        L                                    º
º  714 1      1515   1516   .004980       L                                    º
º  715 1      1516   1517   .00677        L                                    º
º  716 1      1401   1402   .000628       L  BOTTOM PCB GRND LYR NODE-NODE     º
º  717 1      1401   1407   .000314       L                                    º
º  718 1      1401   1414   .000732       L                                    º
º  719 1      1402   1403   .000598       L                                    º
º  720 1      1402   1407   .000261       L                                    º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èèè Ctrl:Copyèèèèèèèèèèèèèè ITAS Conductor Data Entry èèèèèèèèèèèèèè ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                     □
□  721 1       1403   1404    .0006597      L  BOTTOM PCB GRND LYR NODE-NODE   □
□  722 1       1403   1408    .0001342      L                                  □
□  723 1       1404   1405    .0008874      L                                  □
□  724 1       1404   1409    .0000524      L                                  □
□  725 1       1404   1410    .0000444      L                                  □
□  726 1       1404   1411    .0000596      L                                  □
□  727 1       1405   1406    .0005366      L                                  □
□  728 1       1405   1412    .0000524      L                                  □
□  729 1       1406   1417    .0004594      L                                  □
□  730 1       1406   1413    .0002978      L                                  □
□  731 1       1407   1408    .0002991      L                                  □
□  732 1       1407   1414    .0001861      L                                  □
□  733 1       1408   1409    .0002796      L                                  □
□  734 1       1408   1415    .0001340      L                                  □
□  735 1       1409   1410    .0009901      L                                  □
□  736 1       1409   1415    .0000524      L                                  □
□  737 1       1410   1411    .0009178      L                                  □
□  738 1       1410   1415    .0000444      L                                  □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

èèè Ctrl:Copyèèèèèèèèèèèèèè ITAS Conductor Data Entry èèèèèèèèèèèèèè ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                     □
□  739 1       1411   1412    .000804       L  BOTTOM PCB GRND LYR NODE-NODE   □
□  740 1       1411   1415    .0000596      L                                  □
□  741 1       1412   1413    .000268       L                                  □
□  742 1       1412   1416    .0000596      L                                  □
□  743 1       1413   1417    .0003829      L                                  □
□  744 1       1413   1416    .0003752      L                                  □
□  745 1       1414   1415    .000469       L                                  □
□  746 1       1415   1416    .0003450      L                                  □
□  747 1       1416   1417    .000469       L                                  □
□  748 1       1301   1302    .009055       L                                  □
□  749 1       1301   1307    .004528       L  BOTTOM PCB MID POLY LYR NODE-NODE □
□  750 1       1301   1314    .01060        L                                  □
□  751 1       1302   1303    .00863        L                                  □
□  752 1       1302   1307    .002684       L                                  □
□  753 1       1303   1304    .009516       L                                  □
□  754 1       1303   1308    .001929       L                                  □
□  755 1       1304   1305    .01280        L                                  □
□  756 1       1304   1309    .000752       L                                  □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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ÈËË Ctrl:CopyËËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From   To     Cond. Value  L/R Description                        º
º  757 1      1304   1310   .000644       L  BOTTOM PCB MID POLY LYR NODE-NODE º
º  758 1      1304   1311   .000860       L                                    º
º  759 1      1305   1306   .007733       L                                    º
º  760 1      1305   1312   .000860       L                                    º
º  761 1      1306   1317   .006629       L                                    º
º  762 1      1306   1313   .004293       L                                    º
º  763 1      1307   1308   .004315       L                                    º
º  764 1      1307   1314   .002416       L                                    º
º  765 1      1308   1309   .004033       L                                    º
º  766 1      1308   1315   .00232        L                                    º
º  767 1      1309   1310   .01439        L                                    º
º  768 1      1309   1315   .000691       L                                    º
º  769 1      1310   1311   .01324        L                                    º
º  770 1      1310   1315   .00058        L                                    º
º  771 1      1311   1312   .0116         L                                    º
º  772 1      1311   1315   .000774       L                                    º
º  773 1      1312   1313   .003867       L                                    º
º  774 1      1312   1316   .000774       L                                    º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ÈËË Ctrl:CopyËËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From   To     Cond. Value  L/R Description                        º
º  775 1      1313   1317   .003314       L  BOTTOM PCB MID POLY LYR NODE-NODE º
º  776 1      1313   1316   .003864       L                                    º
º  777 1      1314   1315   .00677        L                                    º
º  778 1      1315   1316   .004980       L                                    º
º  779 1      1316   1317   .00677        L                                    º
º  780 1      1201   1202   .0006276      L  BOTTOM PCB TOP Cu LYR NODE-NODE   º
º  781 1      1201   1207   .0003138      L                                    º
º  782 1      1201   1214   .0007322      L                                    º
º  783 1      1202   1203   .0005983      L                                    º
º  784 1      1202   1207   .0002613      L                                    º
º  785 1      1203   1204   .0006597      L                                    º
º  786 1      1203   1208   .0001342      L                                    º
º  787 1      1204   1205   .0008874      L                                    º
º  788 1      1204   1209   .0000524      L                                    º
º  789 1      1204   1210   .0000444      L                                    º
º  790 1      1204   1211   .0000596      L                                    º
º  791 1      1205   1206   .000536       L                                    º
º  792 1      1205   1212   .0000524      L                                    º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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□                                                                              □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                     □
□  793 1      1206    1217    .0004594      L  BOTTOM PCB TOP Cu LYR NODE-NODE □
□  794 1      1206    1213    .0002978      L                                  □
□  795 1      1207    1208    .0002992      L                                  □
□  796 1      1207    1214    .0001861      L                                  □
□  797 1      1208    1209    .0002796      L                                  □
□  798 1      1208    1215    .0001340      L                                  □
□  799 1      1209    1210    .0009901      L                                  □
□  800 1      1209    1215    .0000524      L                                  □
□  801 1      1210    1211    .0009178      L                                  □
□  802 1      1210    1215    .0000444      L                                  □
□  803 1      1211    1212    .000804       L                                  □
□  804 1      1211    1215    .0000596      L                                  □
□  805 1      1212    1213    .000268       L                                  □
□  806 1      1212    1216    .0000596      L                                  □
□  807 1      1213    1217    .0003829      L                                  □
□  808 1      1213    1216    .0003752      L                                  □
□  809 1      1214    1215    .000469       L                                  □
□  810 1      1215    1216    .0003450      L                                  □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                    End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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ëëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                     □
□  811 1      1216    1217    .000469       L  BOTTOM PCB TOP Cu LYR NODE-NODE □
□  812 1      1101    1102    .009055       L  BOTTOM PCB TOP POLY LYR NODE-NODE □
□  813 1      1101    1107    .004528       L                                  □
□  814 1      1101    1114    .010570       L                                  □
□  815 1      1102    1103    .008631       L                                  □
□  816 1      1102    1107    .002684       L                                  □
□  817 1      1103    1104    .009516       L                                  □
□  818 1      1103    1108    .001929       L                                  □
□  819 1      1104    1105    .012804       L                                  □
□  820 1      1104    1109    .000752       L                                  □
□  821 1      1104    1110    .000644       L                                  □
□  822 1      1104    1111    .0008596      L                                  □
□  823 1      1105    1106    .007733       L                                  □
□  824 1      1105    1112    .0008596      L                                  □
□  825 1      1106    1117    .006629       L                                  □
□  826 1      1106    1113    .004293       L                                  □
□  827 1      1107    1108    .004315       L                                  □
□  828 1      1107    1114    .002416       L                                  □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                    End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
¤                                                                             ¤
¤ SqNo FACTOR From   To     Cond. Value  L/R Description                      ¤
¤  829 1       1108   1109   .004033      L  BOTTOM PCB TOP POLY LYR NODE-NODE ¤
¤  830 1       1108   1115   .00232       L                                   ¤
¤  831 1       1109   1110   .01429       L                                   ¤
¤  832 1       1109   1115   .000691      L                                   ¤
¤  833 1       1110   1111   .013242      L                                   ¤
¤  834 1       1110   1115   .00058       L                                   ¤
¤  835 1       1111   1112   .0116        L                                   ¤
¤  836 1       1111   1115   .000774      L                                   ¤
¤  837 1       1112   1113   .003867      L                                   ¤
¤  838 1       1112   1116   .000774      L                                   ¤
¤  839 1       1113   1117   .003314      L                                   ¤
¤  840 1       1113   1116   .003864      L                                   ¤
¤  841 1       1114   1115   .00677       L                                   ¤
¤  842 1       1115   1116   .004980      L                                   ¤
¤  843 1       1116   1117   .00677       L                                   ¤
¤  844 1       1601   1501   1.53206      L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
¤  845 1       1602   1502   .89779       L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
¤  846 1       1603   1503   .64634       L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed            PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur              End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
¤                                                                             ¤
¤ SqNo FACTOR From   To     Cond. Value  L/R Description                      ¤
¤  847 1       1604   1504   .75416       L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
¤  848 1       1605   1505   .28726       L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
¤  849 1       1606   1506   1.43631      L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
¤  850 1       1607   1507   .44889       L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
¤  851 1       1608   1508   .323276      L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
¤  852 1       1609   1509   .12517       L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
¤  853 1       1610   1510   .10763       L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
¤  854 1       1611   1511   .14363       L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
¤  855 1       1612   1512   .14363       L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
¤  856 1       1613   1513   .71815       L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
¤  857 1       1614   1514   1.04774      L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
¤  858 1       1615   1515   1.63375      L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
¤  859 1       1616   1516   2.0108       L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
¤  860 1       1617   1517   1.53206      L  BOTTOM PCB LAYER 16XX TO 15XX     ¤
¤  861 1       1501   1401   1.53206      L  BOTTOM PCB LAYER 15XX TO 14XX     ¤
¤  862 1       1502   1402   .89779       L  BOTTOM PCB LAYER 15XX TO 14XX     ¤
¤  863 1       1503   1403   .64634       L  BOTTOM PCB LAYER 15XX TO 14XX     ¤
¤  864 1       1504   1404   .75416       L  BOTTOM PCB LAYER 15XX TO 14XX     ¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed            PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur              End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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SqNo	FACTOR	From	To	Cond. Value	L/R	Description
865	1	1505	1405	.28726	L	BOTTOM PCB LAYER 15XX TO 14XX
866	1	1506	1406	1.43631	L	BOTTOM PCB LAYER 15XX TO 14XX
867	1	1507	1407	.44889	L	BOTTOM PCB LAYER 15XX TO 14XX
868	1	1508	1408	.32327	L	BOTTOM PCB LAYER 15XX TO 14XX
869	1	1509	1409	.12517	L	BOTTOM PCB LAYER 15XX TO 14XX
870	1	1510	1410	.10763	L	BOTTOM PCB LAYER 15XX TO 14XX
871	1	1511	1411	.14363	L	BOTTOM PCB LAYER 15XX TO 14XX
872	1	1512	1412	.14363	L	BOTTOM PCB LAYER 15XX TO 14XX
873	1	1513	1413	.71815	L	BOTTOM PCB LAYER 15XX TO 14XX
874	1	1514	1414	1.04774	L	BOTTOM PCB LAYER 15XX TO 14XX
875	1	1515	1415	1.63375	L	BOTTOM PCB LAYER 15XX TO 14XX
876	1	1516	1416	2.01083	L	BOTTOM PCB LAYER 15XX TO 14XX
877	1	1517	1417	1.53206	L	BOTTOM PCB LAYER 15XX TO 14XX
878	1	1401	1301	1.53206	L	BOTTOM PCB LAYER 14XX TO13XX
879	1	1402	1302	.89779	L	BOTTOM PCB LAYER 14XX TO13XX
880	1	1403	1303	.64634	L	BOTTOM PCB LAYER 14XX TO13XX
881	1	1404	1304	.75416	L	BOTTOM PCB LAYER 14XX TO13XX
882	1	1405	1305	.28726	L	BOTTOM PCB LAYER 14XX TO13XX

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

èëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £

SqNo	FACTOR	From	To	Cond. Value	L/R	Description
883	1	1406	1306	1.43631	L	BOTTOM PCB LAYER 14XX TO13XX
884	1	1407	1307	.44889	L	BOTTOM PCB LAYER 14XX TO13XX
885	1	1408	1308	.32327	L	BOTTOM PCB LAYER 14XX TO13XX
886	1	1409	1309	.12517	L	BOTTOM PCB LAYER 14XX TO13XX
887	1	1410	1310	.10763	L	BOTTOM PCB LAYER 14XX TO13XX
888	1	1411	1311	.14363	L	BOTTOM PCB LAYER 14XX TO13XX
889	1	1412	1312	.14363	L	BOTTOM PCB LAYER 14XX TO13XX
890	1	1413	1313	.71815	L	BOTTOM PCB LAYER 14XX TO13XX
891	1	1414	1314	1.04774	L	BOTTOM PCB LAYER 14XX TO13XX
892	1	1415	1315	1.63375	L	BOTTOM PCB LAYER 14XX TO13XX
893	1	1416	1316	2.01083	L	BOTTOM PCB LAYER 14XX TO13XX
894	1	1417	1317	1.53206	L	BOTTOM PCB LAYER 14XX TO13XX
895	1	1301	1201	1.53206	L	BOTTOM PCB LAYER 13XX TO 12XX
896	1	1302	1202	.89779	L	BOTTOM PCB LAYER 13XX TO 12XX
897	1	1303	1203	.64634	L	BOTTOM PCB LAYER 13XX TO 12XX
898	1	1304	1204	.75416	L	BOTTOM PCB LAYER 13XX TO 12XX
899	1	1305	1205	.28726	L	BOTTOM PCB LAYER 13XX TO 12XX
900	1	1306	1206	1.43631	L	BOTTOM PCB LAYER 13XX TO 12XX

CTRL-F1Import ITAS_NC ALT-F3AutoMLI UDC Allowed PgDn PgUp Home
SHFT-F1Import Column Shift-F3AutoCHT Shift-F5Del/Pur End
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

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èëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                     □
□  901 1       1307   1207    .44889        L  BOTTOM PCB LAYER 13XX TO 12XX   □
□  902 1       1308   1208    .32327        L  BOTTOM PCB LAYER 13XX TO 12XX   □
□  903 1       1309   1209    .12517        L  BOTTOM PCB LAYER 13XX TO 12XX   □
□  904 1       1310   1210    .10763        L  BOTTOM PCB LAYER 13XX TO 12XX   □
□  905 1       1311   1211    .14363        L  BOTTOM PCB LAYER 13XX TO 12XX   □
□  906 1       1312   1212    .14363        L  BOTTOM PCB LAYER 13XX TO 12XX   □
□  907 1       1313   1213    .71815        L  BOTTOM PCB LAYER 13XX TO 12XX   □
□  908 1       1314   1214    1.04774       L  BOTTOM PCB LAYER 13XX TO 12XX   □
□  909 1       1315   1215    1.63375       L  BOTTOM PCB LAYER 13XX TO 12XX   □
□  910 1       1316   1216    2.01083       L  BOTTOM PCB LAYER 13XX TO 12XX   □
□  911 1       1317   1217    1.53206       L  BOTTOM PCB LAYER 13XX TO 12XX   □
□  912 1       1201   1101    1.53206       L  BOTTOM PCB LAYER 12XX TO11XX    □
□  913 1       1202   1102    .89779        L  BOTTOM PCB LAYER 12XX TO11XX    □
□  914 1       1203   1103    .64634        L  BOTTOM PCB LAYER 12XX TO11XX    □
□  915 1       1204   1104    .75416        L  BOTTOM PCB LAYER 12XX TO11XX    □
□  916 1       1205   1105    .28726        L  BOTTOM PCB LAYER 12XX TO11XX    □
□  917 1       1206   1106    1.43631       L  BOTTOM PCB LAYER 12XX TO11XX    □
□  918 1       1207   1107    .44889        L  BOTTOM PCB LAYER 12XX TO11XX    □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI    UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                    End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

èëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                     □
□  919 1       1208   1108    .32327        L  BOTTOM PCB LAYER 12XX TO11XX    □
□  920 1       1209   1109    .12517        L  BOTTOM PCB LAYER 12XX TO11XX    □
□  921 1       1210   1110    .10763        L  BOTTOM PCB LAYER 12XX TO11XX    □
□  922 1       1211   1111    .14363        L  BOTTOM PCB LAYER 12XX TO11XX    □
□  923 1       1212   1112    .14363        L  BOTTOM PCB LAYER 12XX TO11XX    □
□  924 1       1213   1113    .71815        L  BOTTOM PCB LAYER 12XX TO11XX    □
□  925 1       1214   1114    1.04774       L  BOTTOM PCB LAYER 12XX TO11XX    □
□  926 1       1215   1115    1.63375       L  BOTTOM PCB LAYER 12XX TO11XX    □
□  927 1       1216   1116    2.01083       L  BOTTOM PCB LAYER 12XX TO11XX    □
□  928 1       1217   1117    1.53206       L  BOTTOM PCB LAYER 12XX TO11XX    □
□  929 1       2011   101     .000296       L  EQUIV PIN CONDUCTANCE 3.01      □
□  930 1       2012   201     .000197       L  EQUIV PIN CONDUCTANCE 3.01      □
□  931 1       2013   301     .000296       L  EQUIV PIN CONDUCTANCE 3.01      □
□  932 1       2014   401     .000176       L  EQUIV PIN CONDUCTANCE 3.01      □
□  933 1       2015   501     .000296       L  EQUIV PIN CONDUCTANCE 3.01      □
□  934 1       2016   601     .000197       L  EQUIV PIN CONDUCTANCE 3.01      □
□  935 1       2021   102     .000296       L  EQUIV CONDUCTANCE  FOR 3.02     □
□  936 1       2022   202     .000197       L  EQUIV CONDUCTANCE  FOR 3.02     □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI    UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                    End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                            □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                     □
□  937 1      2023   302    .000296       L  EQUIV CONDUCTANCE  FOR 3.02     □
□  938 1      2024   402    .000197       L  EQUIV CONDUCTANCE  FOR 3.02     □
□  939 1      2025   502    .000296       L  EQUIV CONDUCTANCE  FOR 3.02     □
□  940 1      2026   602    .000197       L  EQUIV CONDUCTANCE  FOR 3.02     □
□  941 1      2031   103    .000296       L  EQUIV COND FOR 3.03             □
□  942 1      2032   203    .000197       L  EQUIV COND FOR 3.03             □
□  943 1      2033   303    .000296       L  EQUIV COND FOR 3.03             □
□  944 1      2034   403    .000197       L  EQUIV COND FOR 3.03             □
□  945 1      2035   503    .000296       L  EQUIV COND FOR 3.03             □
□  946 1      2036   603    .000197       L  EQUIV COND FOR 3.03             □
□  947 1      2041   104    .000296       L  EQUIV PIN COND FOR 3.04         □
□  948 1      2042   204    .000198       L  EQUIV PIN COND FOR 3.04         □
□  949 1      2043   304    .000296       L  EQUIV PIN COND FOR 3.04         □
□  950 1      2044   404    .000198       L  EQUIV PIN COND FOR 3.04         □
□  951 1      2045   504    .000296       L  EQUIV PIN COND FOR 3.04         □
□  952 1      2046   604    .000198       L  EQUIV PIN COND FOR 3.04         □
□  953 1      2051   105    .000296       L  EQUIV PIN COND FOR 3.05         □
□  954 1      2052   205    .000197       L  EQUIV PIN COND FOR 3.05         □
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CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur               End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                            □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                     □
□  955 1      2053   305    .000296       L  EQUIV PIN COND FOR 3.05         □
□  956 1      2054   405    .000197       L  EQUIV PIN COND FOR 3.05         □
□  957 1      2055   505    .000296       L  EQUIV PIN COND FOR 3.05         □
□  958 1      2056   605    .000197       L  EQUIV PIN COND FOR 3.05         □
□  959 1      2061   106    .000296       L  EQUIV PIN COND FOR 3.06         □
□  960 1      2062   206    .000198       L  EQUIV PIN COND FOR 3.06         □
□  961 1      2063   306    .000296       L  EQUIV PIN COND FOR 3.06         □
□  962 1      2064   406    .000198       L  EQUIV PIN COND FOR 3.06         □
□  963 1      2065   506    .000296       L  EQUIV PIN COND FOR 3.06         □
□  964 1      2066   606    .000198       L  EQUIV PIN COND FOR 3.06         □
□  965 1      2071   107    .000296       L  EQUIV PIN COND FOR 3.07         □
□  966 1      2072   207    .000197       L  EQUIV PIN COND FOR 3.07         □
□  967 1      2073   307    .000296       L  EQUIV PIN COND FOR 3.07         □
□  968 1      2074   407    .000197       L  EQUIV PIN COND FOR 3.07         □
□  969 1      2075   507    .000296       L  EQUIV PIN COND FOR 3.07         □
□  970 1      2076   607    .000197       L  EQUIV PIN COND FOR 3.07         □
□  971 1      2081   108    .000296       L  EQUIV PIN COND FOR 3.08         □
□  972 1      2082   208    .000197       L  EQUIV PIN COND FOR 3.08         □
äëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur               End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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ÈËË Ctrl:CopyËËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From   To     Cond. Value  L/R Description                       º
º  973 1      2083   308    .000296       L  EQUIV PIN COND FOR 3.08          º
º  974 1      2084   408    .000197       L  EQUIV PIN COND FOR 3.08          º
º  975 1      2085   508    .000296       L  EQUIV PIN COND FOR 3.08          º
º  976 1      2086   608    .000197       L  EQUIV PIN COND FOR 3.08          º
º  977 1      2091   109    .000296       L  EQUIV PIN COND FOR 3.09          º
º  978 1      2092   110    .000197       L  EQUIV PIN COND FOR 3.09          º
º  979 1      2093   111    .000296       L  EQUIV PIN COND FOR 3.09          º
º  980 1      2094   112    .000197       L  EQUIV PIN COND FOR 3.09          º
º  981 1      2095   113    .000296       L  EQUIV PIN COND FOR 3.09          º
º  982 1      2096   114    .000197       L  EQUIV PIN COND FOR 3.09          º
º  983 1      2101   110    .000296       L  EQUIV PIN COND FOR 3.10          º
º  984 1      2102   210    .000197       L  EQUIV PIN COND FOR 3.10          º
º  985 1      2103   310    .000296       L  EQUIV PIN COND FOR 3.10          º
º  986 1      2104   410    .000197       L  EQUIV PIN COND FOR 3.10          º
º  987 1      2105   510    .000296       L  EQUIV PIN COND FOR 3.10          º
º  988 1      2106   610    .000197       L  EQUIV PIN COND FOR 3.10          º
º  989 1      2111   111    .000296       L  EQUIV PIN COND FOR 3.11          º
º  990 1      2112   211    .000197       L  EQUIV PIN COND FOR 3.11          º
ÈËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÍ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ÈËËË Ctrl:CopyËËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From   To     Cond. Value  L/R Description                       º
º  991 1      2113   311    .000296       L  EQUIV PIN COND FOR 3.11          º
º  992 1      2114   411    .000197       L  EQUIV PIN COND FOR 3.11          º
º  993 1      2115   511    .000296       L  EQUIV PIN COND FOR 3.11          º
º  994 1      2116   611    .000197       L  EQUIV PIN COND FOR 3.11          º
º  995 1      2121   112    .000296       L  EQUIV PIN COND FOR 3.12          º
º  996 1      2122   212    .000197       L  EQUIV PIN COND FOR 3.12          º
º  997 1      2123   312    .000296       L  EQUIV PIN COND FOR 3.12          º
º  998 1      2124   412    .000197       L  EQUIV PIN COND FOR 3.12          º
º  999 1      2125   512    .000296       L  EQUIV PIN COND FOR 3.12          º
º 1000 1      2126   612    .000197       L  EQUIV PIN COND FOR 3.12          º
º 1001 1      2131   113    .000296       L  EQUIV PIN COND FOR 2.01          º
º 1002 1      2132   213    .000197       L  EQUIV PIN COND FOR 2.01          º
º 1003 1      2133   313    .000296       L  EQUIV PIN COND FOR 2.01          º
º 1004 1      2134   413    .000197       L  EQUIV PIN COND FOR 2.01          º
º 1005 1      2135   513    .000296       L  EQUIV PIN COND FOR 2.01          º
º 1006 1      2136   613    .000197       L  EQUIV PIN COND FOR 2.01          º
º 1007 1      2141   114    .000296       L  EQUIV PIN COND FOR 2.02          º
º 1008 1      2142   214    .000197       L  EQUIV PIN COND FOR 2.02          º
ÈËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÍ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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ÈËËË Ctrl:CopyËËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From    To      Cond. Value  L/R Description                     º
º 1009 1      2143    314     .000296       L  EQUIV PIN COND FOR 2.02        º
º 1010 1      2144    414     .000197       L  EQUIV PIN COND FOR 2.02        º
º 1011 1      2145    514     .000296       L  EQUIV PIN COND FOR 2.02        º
º 1012 1      2146    614     .000197       L  EQUIV PIN COND FOR 2.02        º
º 1013 1      2151    115     .000296       L  EQUIV PIN COND FOR 2.03        º
º 1014 1      2152    215     .000197       L  EQUIV PIN COND FOR 2.03        º
º 1015 1      2153    315     .000296       L  EQUIV PIN COND FOR 2.03        º
º 1016 1      2154    415     .000197       L  EQUIV PIN COND FOR 2.03        º
º 1017 1      2155    515     .000296       L  EQUIV PIN COND FOR 2.03        º
º 1018 1      2156    615     .000197       L  EQUIV PIN COND FOR 2.03        º
º 1019 1      2161    116     .000296       L  EQUIV PIN COND FOR 2.04        º
º 1020 1      2162    216     .000197       L  EQUIV PIN COND FOR 2.04        º
º 1021 1      2163    316     .000296       L  EQUIV PIN COND FOR 2.04        º
º 1022 1      2164    416     .000197       L  EQUIV PIN COND FOR 2.04        º
º 1023 1      2165    516     .000296       L  EQUIV PIN COND FOR 2.04        º
º 1024 1      2166    616     .000197       L  EQUIV PIN COND FOR 2.04        º
º 1025 1      2171    117     .000296       L  EQUIV PIN COND FOR 2.05        º
º 1026 1      2172    217     .000197       L  EQUIV PIN COND FOR 2.05        º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ÈËËË Ctrl:CopyËËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From    To      Cond. Value  L/R Description                     º
º 1027 1      2173    317     .000296       L  EQUIV PIN COND FOR 2.05        º
º 1028 1      2174    417     .000197       L  EQUIV PIN COND FOR 2.05        º
º 1029 1      2175    517     .000296       L  EQUIV PIN COND FOR 2.05        º
º 1030 1      2176    617     .000197       L  EQUIV PIN COND FOR 2.05        º
º 1031 1      2181    118     .000296       L  EQUIV PIN COND FOR 2.06        º
º 1032 1      2182    218     .000197       L  EQUIV PIN COND FOR 2.06        º
º 1033 1      2183    318     .000296       L  EQUIV PIN COND FOR 2.06        º
º 1034 1      2184    418     .000197       L  EQUIV PIN COND FOR 2.06        º
º 1035 1      2185    518     .000296       L  EQUIV PIN COND FOR 2.06        º
º 1036 1      2186    618     .000197       L  EQUIV PIN COND FOR 2.06        º
º 1037 1      2191    119     .000296       L  EQUIV PIN COND FOR 2.07        º
º 1038 1      2192    219     .000197       L  EQUIV PIN COND FOR 2.07        º
º 1039 1      2193    319     .000296       L  EQUIV PIN COND FOR 2.07        º
º 1040 1      2194    419     .000197       L  EQUIV PIN COND FOR 2.07        º
º 1041 1      2195    519     .000296       L  EQUIV PIN COND FOR 2.07        º
º 1042 1      2196    619     .000197       L  EQUIV PIN COND FOR 2.07        º
º 1043 1      2201    120     .000296       L  EQUIV PIN COND FOR 2.08        º
º 1044 1      2202    220     .000197       L  EQUIV PIN COND FOR 2.08        º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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¤                                                                              ¤
¤ SqNo FACTOR From   To     Cond. Value  L/R Description                      ¤
¤ 1045 1       2203   320    .000296       L   EQUIV PIN COND FOR 2.08         ¤
¤ 1046 1       2204   420    .000197       L   EQUIV PIN COND FOR 2.08         ¤
¤ 1047 1       2205   520    .000296       L   EQUIV PIN COND FOR 2.08         ¤
¤ 1048 1       2206   620    .000197       L   EQUIV PIN COND FOR 2.08         ¤
¤ 1049 1       2211   121    .000296       L   EQUIV PIN COND FOR 2.09         ¤
¤ 1050 1       2212   221    .000197       L   EQUIV PIN COND FOR 2.09         ¤
¤ 1051 1       2213   321    .000296       L   EQUIV PIN COND FOR 2.09         ¤
¤ 1052 1       2214   421    .000197       L   EQUIV PIN COND FOR 2.09         ¤
¤ 1053 1       2215   521    .000296       L   EQUIV PIN COND FOR 2.09         ¤
¤ 1054 1       2216   621    .000197       L   EQUIV PIN COND FOR 2.09         ¤
¤ 1055 1       2221   122    .000296       L   EQUIV PIN COND FOR 2.10         ¤
¤ 1056 1       2222   222    .000197       L   EQUIV PIN COND FOR 2.10         ¤
¤ 1057 1       2223   322    .000296       L   EQUIV PIN COND FOR 2.10         ¤
¤ 1058 1       2224   422    .000197       L   EQUIV PIN COND FOR 2.10         ¤
¤ 1059 1       2225   522    .000296       L   EQUIV PIN COND FOR 2.10         ¤
¤ 1060 1       2226   622    .000197       L   EQUIV PIN COND FOR 2.10         ¤
¤ 1061 1       2231   123    .000296       L   EQUIV PIN COND FOR 2.11         ¤
¤ 1062 1       2232   223    .000197       L   EQUIV PIN COND FOR 2.11         ¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                 End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
¤                                                                              ¤
¤ SqNo FACTOR From   To     Cond. Value  L/R Description                      ¤
¤ 1063 1       2233   323    .000296       L   EQUIV PIN COND FOR 2.11         ¤
¤ 1064 1       2234   423    .000197       L   EQUIV PIN COND FOR 2.11         ¤
¤ 1065 1       2235   523    .000296       L   EQUIV PIN COND FOR 2.11         ¤
¤ 1066 1       2236   623    .000197       L   EQUIV PIN COND FOR 2.11         ¤
¤ 1067 1       2241   124    .000296       L   EQUIV PIN COND FOR 2.12         ¤
¤ 1068 1       2242   224    .000197       L   EQUIV PIN COND FOR 2.12         ¤
¤ 1069 1       2243   324    .000296       L   EQUIV PIN COND FOR 2.12         ¤
¤ 1070 1       2244   424    .000197       L   EQUIV PIN COND FOR 2.12         ¤
¤ 1071 1       2245   524    .000296       L   EQUIV PIN COND FOR 2.12         ¤
¤ 1072 1       2246   624    .000197       L   EQUIV PIN COND FOR 2.12         ¤
¤ 1073 1       2251   125    .000296       L   EQUIV PIN COND FOR 2.13         ¤
¤ 1074 1       2252   225    .000197       L   EQUIV PIN COND FOR 2.13         ¤
¤ 1075 1       2253   325    .000296       L   EQUIV PIN COND FOR 2.13         ¤
¤ 1076 1       2254   425    .000197       L   EQUIV PIN COND FOR 2.13         ¤
¤ 1077 1       2255   525    .000296       L   EQUIV PIN COND FOR 2.13         ¤
¤ 1078 1       2256   625    .000197       L   EQUIV PIN COND FOR 2.13         ¤
¤ 1079 1       2261   126    .000296       L   EQUIV PIN COND FOR 2.14         ¤
¤ 1080 1       2262   226    .000197       L   EQUIV PIN COND FOR 2.14         ¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                 End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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ëëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                               □
□ SqNo FACTOR From     To      Cond. Value  L/R Description                     □
□ 1081 1      2263     326     .000296       L  EQUIV PIN COND FOR 2.14         □
□ 1082 1      2264     426     .000197       L  EQUIV PIN COND FOR 2.14         □
□ 1083 1      2265     526     .000296       L  EQUIV PIN COND FOR 2.14         □
□ 1084 1      2266     626     .000197       L  EQUIV PIN COND FOR 2.14         □
□ 1085 1      2271     127     .000296       L  EQUIV PIN COND FOR 2.15         □
□ 1086 1      2272     227     .000197       L  EQUIV PIN COND FOR 2.15         □
□ 1087 1      2273     327     .000296       L  EQUIV PIN COND FOR 2.15         □
□ 1088 1      2274     427     .000197       L  EQUIV PIN COND FOR 2.15         □
□ 1089 1      2275     527     .000296       L  EQUIV PIN COND FOR 2.15         □
□ 1090 1      2276     627     .000197       L  EQUIV PIN COND FOR 2.15         □
□ 1091 1      2281     128     .000296       L  EQUIV PIN COND FOR 2.16         □
□ 1092 1      2282     228     .000197       L  EQUIV PIN COND FOR 2.16         □
□ 1093 1      2283     328     .000296       L  EQUIV PIN COND FOR 2.16         □
□ 1094 1      2284     428     .000197       L  EQUIV PIN COND FOR 2.16         □
□ 1095 1      2285     528     .000296       L  EQUIV PIN COND FOR 2.16         □
□ 1096 1      2286     628     .000197       L  EQUIV PIN COND FOR 2.16         □
□ 1097 1      2291     129     .000296       L  EQUIV PIN COND FOR 2.17         □
□ 1098 1      2292     229     .000197       L  EQUIV PIN COND FOR 2.17         □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI    UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT    Shift-F5Del/Pur                    End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ëëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                               □
□ SqNo FACTOR From     To      Cond. Value  L/R Description                     □
□ 1099 1      2293     329     .000296       L  EQUIV PIN COND FOR 2.17         □
□ 1100 1      2294     429     .000197       L  EQUIV PIN COND FOR 2.17         □
□ 1101 1      2295     529     .000296       L  EQUIV PIN COND FOR 2.17         □
□ 1102 1      2296     629     .000197       L  EQUIV PIN COND FOR 2.17         □
□ 1103 1      2301     130     .000296       L  EQUIV PIN COND FOR 2.18         □
□ 1104 1      2302     230     .000197       L  EQUIV PIN COND FOR 2.18         □
□ 1105 1      2303     330     .000296       L  EQUIV PIN COND FOR 2.18         □
□ 1106 1      2304     430     .000197       L  EQUIV PIN COND FOR 2.18         □
□ 1107 1      2305     530     .000296       L  EQUIV PIN COND FOR 2.18         □
□ 1108 1      2306     630     .000197       L  EQUIV PIN COND FOR 2.18         □
□ 1109 1      3011     1101    .000296       L  EQUIV PIN COND FOR 4.00         □
□ 1110 1      3012     1201    .000197       L  EQUIV PIN COND FOR 4.00         □
□ 1111 1      3013     1301    .000296       L  EQUIV PIN COND FOR 4.00         □
□ 1112 1      3014     1401    .000197       L  EQUIV PIN COND FOR 4.00         □
□ 1113 1      3015     1501    .000296       L  EQUIV PIN COND FOR 4.00         □
□ 1114 1      3016     1601    .000197       L  EQUIV PIN COND FOR 4.00         □
□ 1115 1      3021     1102    .000296       L  EQUIV PIN COND FOR 5.01         □
□ 1116 1      3022     1202    .000197       L  EQUIV PIN COND FOR 5.01         □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI    UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT    Shift-F5Del/Pur                    End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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ÈËË Ctrl:CopyËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From    To      Cond. Value  L/R Description                     º
º 1117 1      3023    1302    .000296       L  EQUIV PIN COND FOR 5.01        º
º 1118 1      3024    1402    .000197       L  EQUIV PIN COND FOR 5.01        º
º 1119 1      3025    1502    .000296       L  EQUIV PIN COND FOR 5.01        º
º 1120 1      3026    1602    .000197       L  EQUIV PIN COND FOR 5.01        º
º 1121 1      3031    1103    .000296       L  EQUIV PIN COND FOR 5.02        º
º 1122 1      3032    1203    .000197       L  EQUIV PIN COND FOR 5.02        º
º 1123 1      3033    1303    .000296       L  EQUIV PIN COND FOR 5.02        º
º 1124 1      3034    1403    .000197       L  EQUIV PIN COND FOR 5.02        º
º 1125 1      3035    1503    .000296       L  EQUIV PIN COND FOR 5.02        º
º 1126 1      3036    1603    .000197       L  EQUIV PIN COND FOR 5.02        º
º 1127 1      3041    1104    .000296       L  EQUIV PIN COND FOR 5.03        º
º 1128 1      3042    1204    .000197       L  EQUIV PIN COND FOR 5.03        º
º 1129 1      3043    1304    .000296       L  EQUIV PIN COND FOR 5.03        º
º 1130 1      3044    1404    .000197       L  EQUIV PIN COND FOR 5.03        º
º 1131 1      3045    1504    .000296       L  EQUIV PIN COND FOR 5.03        º
º 1132 1      3046    1604    .000197       L  EQUIV PIN COND FOR 5.03        º
º 1133 1      3051    1105    .000296       L  EQUIV PIN COND FOR 5.04        º
º 1134 1      3052    1205    .000197       L  EQUIV PIN COND FOR 5.04        º
ÈËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÊ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ÈËËË Ctrl:CopyËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From    To      Cond. Value  L/R Description                     º
º 1135 1      3053    1305    .000296       L  EQUIV PIN COND FOR 5.04        º
º 1136 1      3054    1405    .000197       L  EQUIV PIN COND FOR 5.04        º
º 1137 1      3055    1505    .000296       L  EQUIV PIN COND FOR 5.04        º
º 1138 1      3056    1605    .000197       L  EQUIV PIN COND FOR 5.04        º
º 1139 1      3061    1106    .000296       L  EQUIV PIN COND FOR 5.05        º
º 1140 1      3062    1206    .000197       L  EQUIV PIN COND FOR 5.05        º
º 1141 1      3063    1306    .000296       L  EQUIV PIN COND FOR 5.05        º
º 1142 1      3064    1406    .000197       L  EQUIV PIN COND FOR 5.05        º
º 1143 1      3065    1506    .000296       L  EQUIV PIN COND FOR 5.05        º
º 1144 1      3066    1606    .000197       L  EQUIV PIN COND FOR 5.05        º
º 1145 1      3091    1109    .000296       L  EQUIV PIN COND FOR 6.03        º
º 1146 1      3092    1209    .000197       L  EQUIV PIN COND FOR 6.03        º
º 1147 1      3093    1309    .000296       L  EQUIV PIN COND FOR 6.03        º
º 1148 1      3094    1409    .000197       L  EQUIV PIN COND FOR 6.03        º
º 1149 1      3095    1509    .000296       L  EQUIV PIN COND FOR 6.03        º
º 1150 1      3096    1609    .000197       L  EQUIV PIN COND FOR 6.03        º
º 1151 1      3101    1110    .000296       L  EQUIV PIN COND FOR 6.04        º
º 1152 1      3102    1210    .000197       L  EQUIV PIN COND FOR 6.04        º
ÈËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÊ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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ÚÄÄÄ Ctrl:CopyÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ITAS Conductor Data Entry ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ESC:Quit ¿
³                                                                              ³
³ SqNo FACTOR From    To      Cond. Value  L/R Description                     ³
³ 1153 1      3103    1310    .000296       L  EQUIV PIN COND FOR 6.04        ³
³ 1154 1      3104    1410    .000197       L  EQUIV PIN COND FOR 6.04        ³
³ 1155 1      3105    1510    .000296       L  EQUIV PIN COND FOR 6.04        ³
³ 1156 1      3106    1610    .000197       L  EQUIV PIN COND FOR 6.04        ³
³ 1157 1      3111    1111    .000296       L  EQUIV PIN COND FOR 6.05        ³
³ 1158 1      3112    1211    .000197       L  EQUIV PIN COND FOR 6.05        ³
³ 1159 1      3113    1311    .000296       L  EQUIV PIN COND FOR 6.05        ³
³ 1160 1      3114    1411    .000197       L  EQUIV PIN COND FOR 6.05        ³
³ 1161 1      3115    1511    .000296       L  EQUIV PIN COND FOR 6.05        ³
³ 1162 1      3116    1611    .000197       L  EQUIV PIN COND FOR 6.05        ³
³ 1163 1      3121    1112    .000296       L  EQUIV PIN COND FOR 6.06        ³
³ 1164 1      3122    1212    .000197       L  EQUIV PIN COND FOR 6.06        ³
³ 1165 1      3123    1312    .000296       L  EQUIV PIN COND FOR 6.06        ³
³ 1166 1      3124    1412    .000197       L  EQUIV PIN COND FOR 6.06        ³
³ 1167 1      3125    1512    .000296       L  EQUIV PIN COND FOR 6.06        ³
³ 1168 1      3126    1612    .000197       L  EQUIV PIN COND FOR 6.06        ³
³ 1169 1      3141    1114    .000296       L  EQUIV PIN COND FOR 7.01        ³
³ 1170 1      3142    1214    .000197       L  EQUIV PIN COND FOR 7.01        ³
ÀÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ÚÄÄÄ Ctrl:CopyÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ITAS Conductor Data Entry ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ESC:Quit ¿
³                                                                              ³
³ SqNo FACTOR From    To      Cond. Value  L/R Description                     ³
³ 1171 1      3143    1314    .000197       L  EQUIV PIN COND FOR 7.01        ³
³ 1172 1      3144    1414    .000296       L  EQUIV PIN COND FOR 7.01        ³
³ 1173 1      3145    1514    .000197       L  EQUIV PIN COND FOR 7.01        ³
³ 1174 1      3146    1614    .000296       L  EQUIV PIN COND FOR 7.01        ³
³ 1175 1      3151    1115    .000197       L  EQUIV PIN COND FOR 7.02        ³
³ 1176 1      3152    1215    .000296       L  EQUIV PIN COND FOR 7.02        ³
³ 1177 1      3153    1315    .000197       L  EQUIV PIN COND FOR 7.02        ³
³ 1178 1      3154    1415    .000296       L  EQUIV PIN COND FOR 7.02        ³
³ 1179 1      3155    1515    .000197       L  EQUIV PIN COND FOR 7.02        ³
³ 1180 1      3156    1615    .000296       L  EQUIV PIN COND FOR 7.02        ³
³ 1181 1      3161    1116    .000197       L  EQUIV PIN COND FOR 7.03        ³
³ 1182 1      3162    1216    .000296       L  EQUIV PIN COND FOR 7.03        ³
³ 1183 1      3163    1316    .000197       L  EQUIV PIN COND FOR 7.03        ³
³ 1184 1      3164    1416    .000296       L  EQUIV PIN COND FOR 7.03        ³
³ 1185 1      3165    1516    .000197       L  EQUIV PIN COND FOR 7.03        ³
³ 1186 1      3166    1616    .000296       L  EQUIV PIN COND FOR 7.03        ³
³ 1187 1      3171    1117    .000197       L  EQUIV PIN COND FOR 8.00        ³
³ 1188 1      3172    1217    .000296       L  EQUIV PIN COND FOR 8.00        ³
ÀÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
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ÈËË Ctrl:CopyËËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit £
º                                                                              º
º SqNo FACTOR From   To     Cond. Value  L/R Description                        º
º 1189 1      3173   1317   .000296       L  EQUIV PIN COND FOR 8.00          º
º 1190 1      3174   1417   .000197       L  EQUIV PIN COND FOR 8.00          º
º 1191 1      3175   1517   .000296       L  EQUIV PIN COND FOR 8.00          º
º 1192 1      3176   1617   .000197       L  EQUIV PIN COND FOR 8.00          º
º 1193 1      2011   2012   .1465         L  PIN COND                         º
º 1194 1      2012   2013   .1465         L  PIN COND                         º
º 1195 1      2013   2014   .1465         L  PIN COND                         º
º 1196 1      2014   2015   .1465         L  PIN COND                         º
º 1197 1      2015   2016   .1465         L  PIN COND                         º
º 1198 1      2021   2022   .1465         L  PIN COND                         º
º 1199 1      2022   2023   .1465         L  PIN COND                         º
º 1200 1      2023   2024   .1465         L  PIN COND                         º
º 1201 1      2024   2025   .1465         L  PIN COND                         º
º 1202 1      2025   2026   .1465         L  PIN COND                         º
º 1203 1      2031   2032   .1465         L  PIN COND                         º
º 1204 1      2032   2033   .1465         L  PIN COND                         º
º 1205 1      2033   2034   .1465         L  PIN COND                         º
º 1206 1      2034   2035   .1465         L  PIN COND                         º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ÈËË Ctrl:CopyËËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit £
º                                                                              º
º SqNo FACTOR From   To     Cond. Value  L/R Description                        º
º 1207 1      2035   2036   .1465         L  PIN COND                         º
º 1208 1      2041   2042   .1465         L  PIN COND                         º
º 1209 1      2042   2043   .1465         L  PIN COND                         º
º 1210 1      2043   2044   .1465         L  PIN COND                         º
º 1211 1      2044   2045   .1465         L  PIN COND                         º
º 1212 1      2045   2046   .1465         L  PIN COND                         º
º 1213 1      2051   2052   .1465         L  PIN COND                         º
º 1214 1      2052   2053   .1465         L  PIN COND                         º
º 1215 1      2053   2054   .1465         L  PIN COND                         º
º 1216 1      2054   2055   .1465         L  PIN COND                         º
º 1217 1      2055   2056   .1465         L  PIN COND                         º
º 1218 1      2061   2062   .1465         L  PIN COND                         º
º 1219 1      2062   2063   .1465         L  PIN COND                         º
º 1220 1      2063   2064   .1465         L  PIN COND                         º
º 1221 1      2064   2065   .1465         L  PIN COND                         º
º 1222 1      2065   2066   .1465         L  PIN COND                         º
º 1223 1      2071   2072   .1465         L  PIN COND                         º
º 1224 1      2072   2073   .1465         L  PIN COND                         º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                                  □
□ SqNo FACTOR From    To      Cond. Value   L/R Description                        □
□ 1225 1       2073   2074    .1465          L  PIN COND                           □
□ 1226 1       2074   2075    .1465          L  PIN COND                           □
□ 1227 1       2075   2076    .1465          L  PIN COND                           □
□ 1228 1       2081   2082    .1465          L  PIN COND                           □
□ 1229 1       2082   2083    .1465          L  PIN COND                           □
□ 1230 1       2083   2084    .1465          L  PIN COND                           □
□ 1231 1       2084   2085    .1465          L  PIN COND                           □
□ 1232 1       2085   2086    .1465          L  PIN COND                           □
□ 1233 1       2091   2092    .1465          L  PIN COND                           □
□ 1234 1       2092   2093    .1465          L  PIN COND                           □
□ 1235 1       2093   2094    .1465          L  PIN COND                           □
□ 1236 1       2094   2095    .1465          L  PIN COND                           □
□ 1237 1       2095   2096    .1465          L  PIN COND                           □
□ 1238 1       2101   2102    .1465          L  PIN COND                           □
□ 1239 1       2102   2103    .1465          L  PIN COND                           □
□ 1240 1       2103   2104    .1465          L  PIN COND                           □
□ 1241 1       2104   2105    .1465          L  PIN COND                           □
□ 1242 1       2105   2106    .1465          L  PIN COND                           □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed                PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                   End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

```
èëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                                  □
□ SqNo FACTOR From    To      Cond. Value   L/R Description                        □
□ 1243 1       2111   2112    .1465          L  PIN COND                           □
□ 1244 1       2112   2113    .1465          L  PIN COND                           □
□ 1245 1       2113   2114    .1465          L  PIN COND                           □
□ 1246 1       2114   2115    .1465          L  PIN COND                           □
□ 1247 1       2115   2116    .1465          L  PIN COND                           □
□ 1248 1       2121   2122    .1465          L  PIN COND                           □
□ 1249 1       2122   2123    .1465          L  PIN COND                           □
□ 1250 1       2123   2124    .1465          L  PIN COND                           □
□ 1251 1       2124   2125    .1465          L  PIN COND                           □
□ 1252 1       2125   2126    .1465          L  PIN COND                           □
□ 1253 1       2131   2132    .1465          L  PIN COND                           □
□ 1254 1       2132   2133    .1465          L  PIN COND                           □
□ 1255 1       2133   2134    .1465          L  PIN COND                           □
□ 1256 1       2134   2135    .1465          L  PIN COND                           □
□ 1257 1       2135   2136    .1465          L  PIN COND                           □
□ 1258 1       2141   2142    .1465          L  PIN COND                           □
□ 1259 1       2142   2143    .1465          L  PIN COND                           □
□ 1260 1       2143   2144    .1465          L  PIN COND                           □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed                PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                   End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

```
èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
¤                                                                              ¤
¤ SqNo FACTOR From    To      Cond. Value  L/R Description                     ¤
¤ 1261 1      2144    2145    .1465         L  PIN COND                        ¤
¤ 1262 1      2145    2146    .1465         L  PIN COND                        ¤
¤ 1263 1      2151    2152    .1465         L  PIN COND                        ¤
¤ 1264 1      2152    2153    .1465         L  PIN COND                        ¤
¤ 1265 1      2153    2154    .1465         L  PIN COND                        ¤
¤ 1266 1      2154    2155    .1465         L  PIN COND                        ¤
¤ 1267 1      2155    2156    .1465         L  PIN COND                        ¤
¤ 1268 1      2161    2162    .1465         L  PIN COND                        ¤
¤ 1269 1      2162    2163    .1465         L  PIN COND                        ¤
¤ 1270 1      2163    2164    .1465         L  PIN COND                        ¤
¤ 1271 1      2164    2165    .1465         L  PIN COND                        ¤
¤ 1272 1      2165    2166    .1465         L  PIN COND                        ¤
¤ 1273 1      2171    2172    .1465         L  PIN COND                        ¤
¤ 1274 1      2172    2173    .1465         L  PIN COND                        ¤
¤ 1275 1      2173    2174    .1465         L  PIN COND                        ¤
¤ 1276 1      2174    2175    .1465         L  PIN COND                        ¤
¤ 1277 1      2175    2176    .1465         L  PIN COND                        ¤
¤ 1278 1      2181    2182    .1465         L  PIN COND                        ¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                  End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

```
èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
¤                                                                              ¤
¤ SqNo FACTOR From    To      Cond. Value  L/R Description                     ¤
¤ 1279 1      2182    2183    .1465         L  PIN COND                        ¤
¤ 1280 1      2183    2184    .1465         L  PIN COND                        ¤
¤ 1281 1      2184    2185    .1465         L  PIN COND                        ¤
¤ 1282 1      2185    2186    .1465         L  PIN COND                        ¤
¤ 1283 1      2191    2192    .1465         L  PIN COND                        ¤
¤ 1284 1      2192    2193    .1465         L  PIN COND                        ¤
¤ 1285 1      2193    2194    .1465         L  PIN COND                        ¤
¤ 1286 1      2194    2195    .1465         L  PIN COND                        ¤
¤ 1287 1      2195    2196    .1465         L  PIN COND                        ¤
¤ 1288 1      2201    2202    .1465         L  PIN COND                        ¤
¤ 1289 1      2202    2203    .1465         L  PIN COND                        ¤
¤ 1290 1      2203    2204    .1465         L  PIN COND                        ¤
¤ 1291 1      2204    2205    .1465         L  PIN COND                        ¤
¤ 1292 1      2205    2206    .1465         L  PIN COND                        ¤
¤ 1293 1      2211    2212    .1465         L  PIN COND                        ¤
¤ 1294 1      2212    2213    .1465         L  PIN COND                        ¤
¤ 1295 1      2213    2214    .1465         L  PIN COND                        ¤
¤ 1296 1      2214    2215    .1465         L  PIN COND                        ¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed             PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                  End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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ëëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                     □
□ 1297 1      2215    2216    .1465         L  PIN COND                        □
□ 1298 1      2221    2222    .1465         L  PIN COND                        □
□ 1299 1      2222    2223    .1465         L  PIN COND                        □
□ 1300 1      2223    2224    .1465         L  PIN COND                        □
□ 1301 1      2224    2225    .1465         L  PIN COND                        □
□ 1302 1      2225    2226    .1465         L  PIN COND                        □
□ 1303 1      2231    2232    .1465         L  PIN COND                        □
□ 1304 1      2232    2233    .1465         L  PIN COND                        □
□ 1305 1      2233    2234    .1465         L  PIN COND                        □
□ 1306 1      2234    2235    .1465         L  PIN COND                        □
□ 1307 1      2235    2236    .1465         L  PIN COND                        □
□ 1308 1      2241    2242    .1465         L  PIN COND                        □
□ 1309 1      2242    2243    .1465         L  PIN COND                        □
□ 1310 1      2243    2244    .1465         L  PIN COND                        □
□ 1311 1      2244    2245    .1465         L  PIN COND                        □
□ 1312 1      2245    2246    .1465         L  PIN COND                        □
□ 1313 1      2251    2252    .1465         L  PIN COND                        □
□ 1314 1      2252    2253    .1465         L  PIN COND                        □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC     ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                 End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

```
ëëë Ctrl:Copyëëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From    To      Cond. Value  L/R Description                     □
□ 1315 1      2253    2254    .1465         L  PIN COND                        □
□ 1316 1      2254    2255    .1465         L  PIN COND                        □
□ 1317 1      2255    2256    .1465         L  PIN COND                        □
□ 1318 1      2261    2262    .1465         L  PIN COND                        □
□ 1319 1      2262    2263    .1465         L  PIN COND                        □
□ 1320 1      2263    2264    .1465         L  PIN COND                        □
□ 1321 1      2264    2265    .1465         L  PIN COND                        □
□ 1322 1      2265    2266    .1465         L  PIN COND                        □
□ 1323 1      2271    2272    .1465         L  PIN COND                        □
□ 1324 1      2272    2273    .1465         L  PIN COND                        □
□ 1325 1      2273    2274    .1465         L  PIN COND                        □
□ 1326 1      2274    2275    .1465         L  PIN COND                        □
□ 1327 1      2275    2276    .1465         L  PIN COND                        □
□ 1328 1      2281    2282    .1465         L  PIN COND                        □
□ 1329 1      2282    2283    .1465         L  PIN COND                        □
□ 1330 1      2283    2284    .1465         L  PIN COND                        □
□ 1331 1      2284    2285    .1465         L  PIN COND                        □
□ 1332 1      2285    2286    .1465         L  PIN COND                        □
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC     ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                 End
    F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
¤                                                                          ¤
¤ SqNo FACTOR From    To      Cond. Value   L/R Description                ¤
¤ 1333 1      2291    2292    .1465          L  PIN COND                   ¤
¤ 1334 1      2292    2293    .1465          L  PIN COND                   ¤
¤ 1335 1      2293    2294    .1465          L  PIN COND                   ¤
¤ 1336 1      2294    2295    .1465          L  PIN COND                   ¤
¤ 1337 1      2295    2296    .1465          L  PIN COND                   ¤
¤ 1338 1      2301    2302    .1465          L  PIN COND                   ¤
¤ 1339 1      2302    2303    .1465          L  PIN COND                   ¤
¤ 1340 1      2303    2304    .1465          L  PIN COND                   ¤
¤ 1341 1      2304    2305    .1465          L  PIN COND                   ¤
¤ 1342 1      2305    2306    .1465          L  PIN COND                   ¤
¤ 1343 1      3011    3012    .1465          L  PIN COND                   ¤
¤ 1344 1      3012    3013    .1465          L  PIN COND                   ¤
¤ 1345 1      3013    3014    .1465          L  PIN COND                   ¤
¤ 1346 1      3014    3015    .1465          L  PIN COND                   ¤
¤ 1347 1      3015    3016    .1465          L  PIN COND                   ¤
¤ 1348 1      3021    3022    .1465          L  PIN COND                   ¤
¤ 1349 1      3022    3023    .1465          L  PIN COND                   ¤
¤ 1350 1      3023    3024    .1465          L  PIN COND                   ¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                   End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
¤                                                                          ¤
¤ SqNo FACTOR From    To      Cond. Value   L/R Description                ¤
¤ 1351 1      3024    3025    .1465          L  PIN COND                   ¤
¤ 1352 1      3025    3026    .1465          L  PIN COND                   ¤
¤ 1353 1      3031    3032    .1465          L  PIN COND                   ¤
¤ 1354 1      3032    3033    .1465          L  PIN COND                   ¤
¤ 1355 1      3033    3034    .1465          L  PIN COND                   ¤
¤ 1356 1      3034    3035    .1465          L  PIN COND                   ¤
¤ 1357 1      3035    3036    .1465          L  PIN COND                   ¤
¤ 1358 1      3041    3042    .1465          L  PIN COND                   ¤
¤ 1359 1      3042    3043    .1465          L  PIN COND                   ¤
¤ 1360 1      3043    3044    .1465          L  PIN COND                   ¤
¤ 1361 1      3044    3045    .1465          L  PIN COND                   ¤
¤ 1362 1      3045    3046    .1465          L  PIN COND                   ¤
¤ 1363 1      3051    3052    .1465          L  PIN COND                   ¤
¤ 1364 1      3052    3053    .1465          L  PIN COND                   ¤
¤ 1365 1      3053    3054    .1465          L  PIN COND                   ¤
¤ 1366 1      3054    3055    .1465          L  PIN COND                   ¤
¤ 1367 1      3055    3056    .1465          L  PIN COND                   ¤
¤ 1368 1      3061    3062    .1465          L  PIN COND                   ¤
àëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëëë¥
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                   End
     F1Save/Purge      F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

```
ÈËË Ctrl:CopyËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËË ESC:Quit É
º                                                                            º
º SqNo FACTOR From   To     Cond. Value  L/R Description                     º
º 1369 1      3062   3063   .1465         L  PIN COND                        º
º 1370 1      3063   3064   .1465         L  PIN COND                        º
º 1371 1      3064   3065   .1465         L  PIN COND                        º
º 1372 1      3065   3066   .1465         L  PIN COND                        º
º 1373 1      3091   3092   .1465         L  PIN COND                        º
º 1374 1      3092   3093   .1465         L  PIN COND                        º
º 1375 1      3093   3094   .1465         L  PIN COND                        º
º 1376 1      3094   3095   .1465         L  PIN COND                        º
º 1377 1      3095   3096   .1465         L  PIN COND                        º
º 1378 1      3101   3102   .1465         L  PIN COND                        º
º 1379 1      3102   3103   .1465         L  PIN COND                        º
º 1380 1      3103   3104   .1465         L  PIN COND                        º
º 1381 1      3104   3105   .1465         L  PIN COND                        º
º 1382 1      3105   3106   .1465         L  PIN COND                        º
º 1383 1      3111   3112   .1465         L  PIN COND                        º
º 1384 1      3112   3113   .1465         L  PIN COND                        º
º 1385 1      3113   3114   .1465         L  PIN COND                        º
º 1386 1      3114   3115   .1465         L  PIN COND                        º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ÈËË Ctrl:CopyËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËË ESC:Quit É
º                                                                            º
º SqNo FACTOR From   To     Cond. Value  L/R Description                     º
º 1387 1      3115   3116   .1465         L  PIN COND                        º
º 1388 1      3121   3122   .1465         L  PIN COND                        º
º 1389 1      3122   3123   .1465         L  PIN COND                        º
º 1390 1      3123   3124   .1465         L  PIN COND                        º
º 1391 1      3124   3125   .1465         L  PIN COND                        º
º 1392 1      3125   3126   .1465         L  PIN COND                        º
º 1393 1      3141   3142   .1465         L  PIN COND                        º
º 1394 1      3142   3143   .1465         L  PIN COND                        º
º 1395 1      3143   3144   .1465         L  PIN COND                        º
º 1396 1      3144   3145   .1465         L  PIN COND                        º
º 1397 1      3145   3146   .1465         L  PIN COND                        º
º 1398 1      3151   3152   .1465         L  PIN COND                        º
º 1399 1      3152   3153   .1465         L  PIN COND                        º
º 1400 1      3153   3154   .1465         L  PIN COND                        º
º 1401 1      3154   3155   .1465         L  PIN COND                        º
º 1402 1      3155   3156   .1465         L  PIN COND                        º
º 1403 1      3161   3162   .1465         L  PIN COND                        º
º 1404 1      3162   3163   .1465         L  PIN COND                        º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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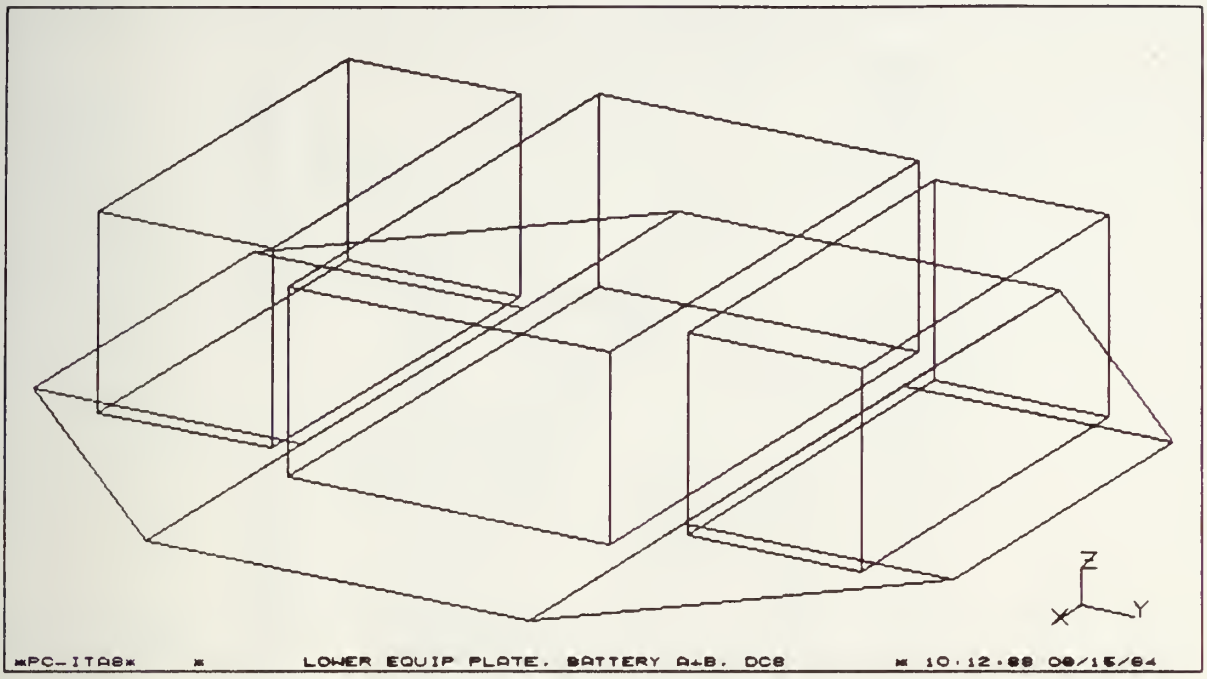
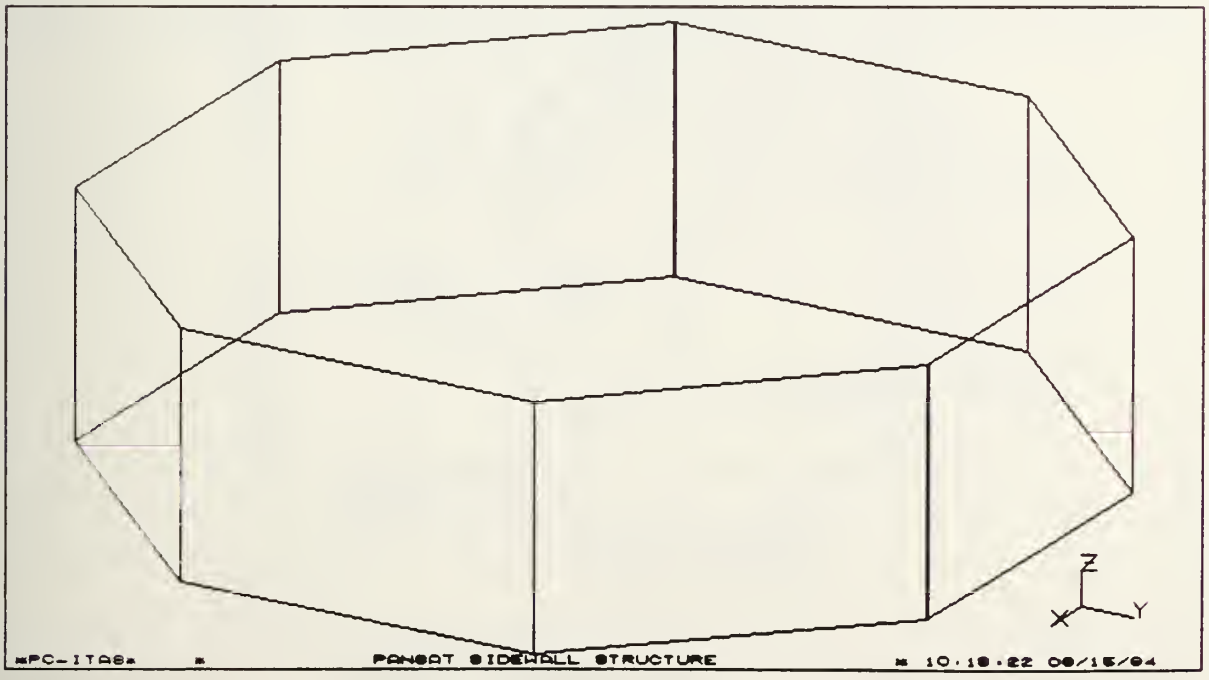
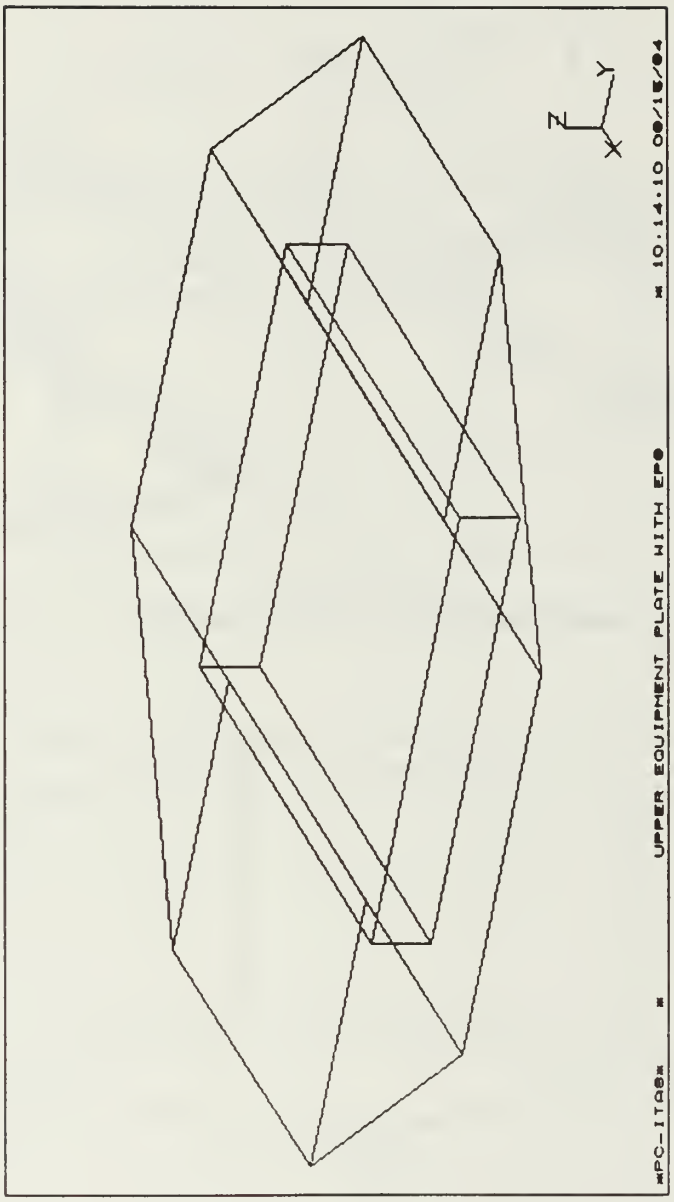
ÈËË Ctrl:CopyËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËËË ESC:Quit É
º                                                                              º
º SqNo FACTOR From    To      Cond. Value  L/R Description                     º
º 1405 1      3163    3164    .1465         L  PIN COND                       º
º 1406 1      3164    3165    .1465         L  PIN COND                       º
º 1407 1      3165    3166    .1465         L  PIN COND                       º
º 1408 1      3171    3172    .1465         L  PIN COND                       º
º 1409 1      3172    3173    .1465         L  PIN COND                       º
º 1410 1      3173    3174    .1465         L  PIN COND                       º
º 1411 1      3174    3175    .1465         L  PIN COND                       º
º 1412 1      3175    3176    .1465         L  PIN COND                       º
º                                                                              º
º                                                                              º
º                                                                              º
º                                                                              º
º                                                                              º
º                                                                              º
º                                                                              º
º                                                                              º
º                                                                              º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

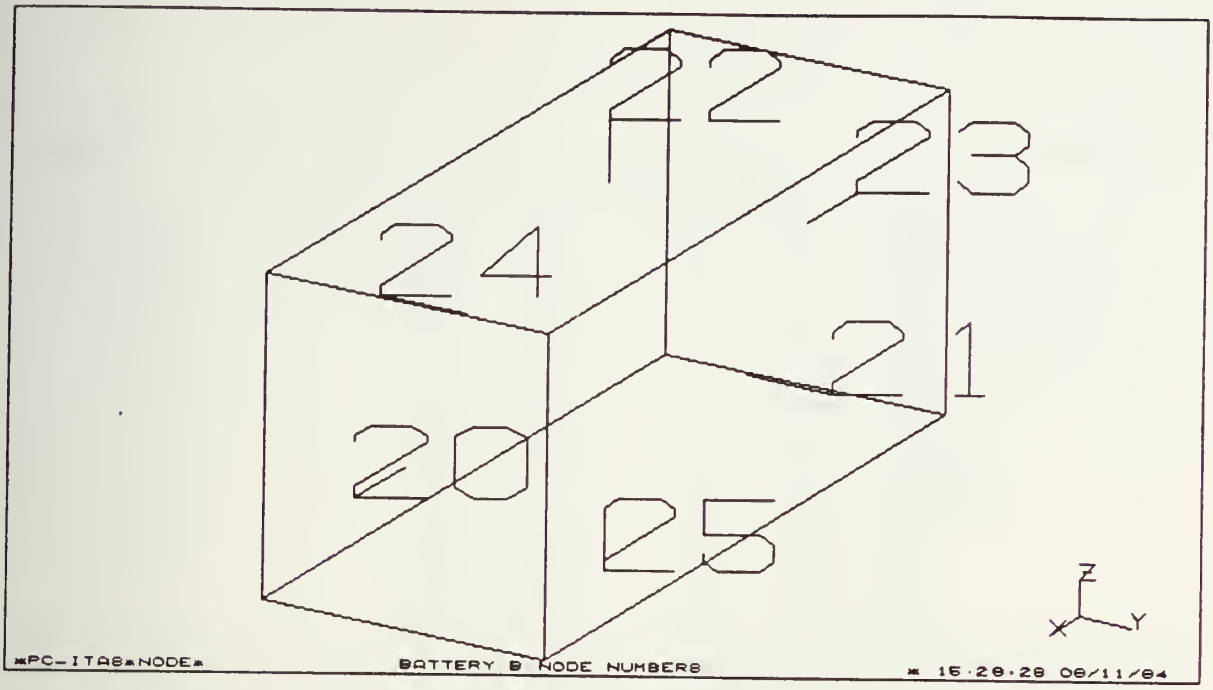
APPENDIX N. ITAS BATTERY GEOMETRY MODEL

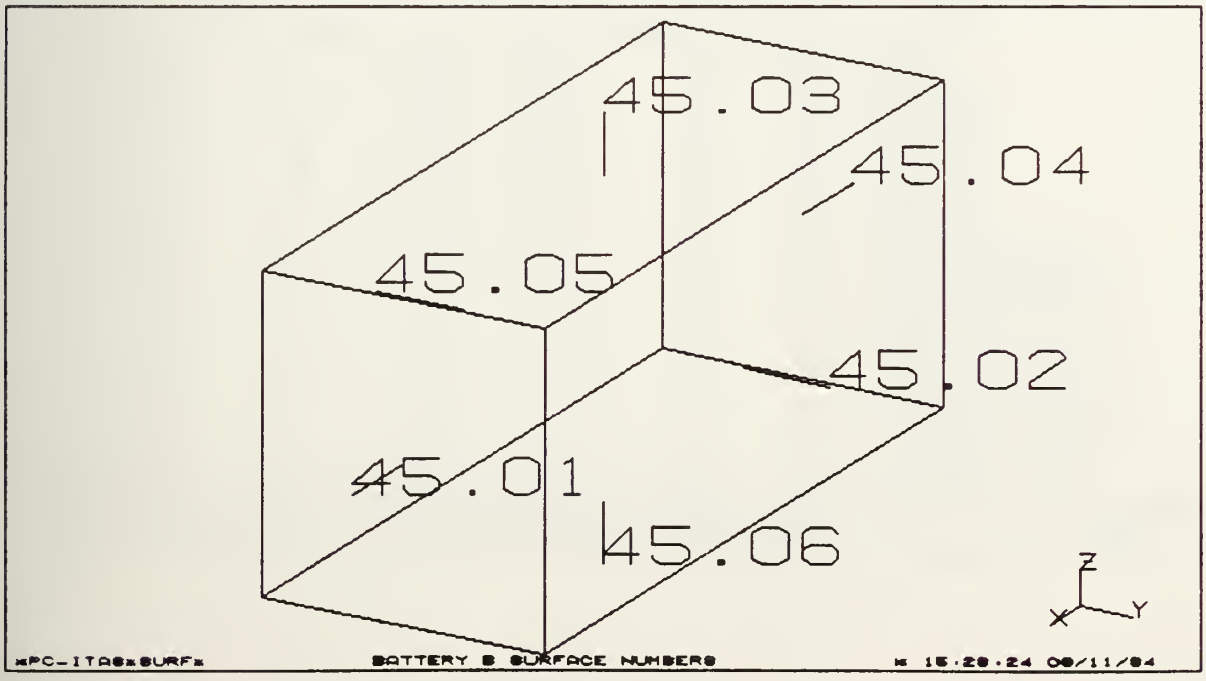





Z
Y
X
UPPER EQUIPMENT PLATE WITH EPO

APPENDIX O. BATTERY B SURFACE AND NODE NUMBERS





APPENDIX P. BATTERY OPTICAL PROPERTIES

PgDn PgUp Home End F2Help

ITAS Property Data Entry

Seq	Surface No	NodeNo	Alpha	Emiss	T/Mass	Dissip	MID	Comments
1	1.00	1	0.400	0.790	1.	0.	144	LOWER EQUIPMENT PL
2	5.00	2	0.400	0.790	1.	0.	144	LOWER EQUIPMENT PL
3	10.00	3	0.400	0.790	1.	0.	144	LOWER EQUIPMENT PL
4	15.00	4	0.400	0.790	1.	0.	144	LOWER EQUIPMENT PL
5	20.00	5	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
6	25.00	6	0.400	0.790	1.	0.	144	LOWER EQUIPMENT PL
7	30.00	7	0.400	0.790	1.	0.	144	LOWER EQUIPMENT PL
8	35.01	8	0.400	0.790	1.	0.	144	BATTERY A
9	35.02	9	0.400	0.790	1.	0.	144	BATTERY A
10	35.03	10	0.400	0.790	1.	0.	144	BATTERY A
11	35.04	11	0.400	0.790	1.	0.	144	BATTERY A
12	35.05	12	0.400	0.790	1.	0.	144	BATTERY A
13	35.06	13	0.400	0.790	1.	0.	144	BATTERY A
14	40.01	14	0.400	0.790	1.	0.	144	DCS
15	40.02	15	0.400	0.790	1.	0.	144	DCS
16	40.03	16	0.400	0.790	1.	0.	144	DCS
17	40.04	17	0.400	0.790	1.	0.	144	DCS
18	40.05	18	0.400	0.790	1.	0.	144	DCS

S-F1Load/Save All S-F4Auto TM UDC Allowed ESCQuit
F1Load/Save Page F3PropLib F4AutoGen F5ImportPropFmt F6NewPropFile F10Search

PgDn PgUp Home End F2Help

ITAS Property Data Entry

Seq	Surface No	NodeNo	Alpha	Emiss	T/Mass	Dissip	MID	Comments
19	40.06	19	0.400	0.790	1.	0.	144	DCS
20	45.01	20	0.400	0.790	1.	0.	144	BATTERY B
21	45.02	21	0.400	0.790	1.	0.	144	BATTERY B
22	45.03	22	0.400	0.790	1.	0.	144	BATTERY B
23	45.04	23	0.400	0.790	1.	0.	144	BATTERY B
24	45.05	24	0.400	0.790	1.	0.	144	BATTERY B
25	45.06	25	0.400	0.790	1.	0.	144	BATTERY B
26	51.00	26	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
27	55.00	27	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
28	60.00	28	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
29	65.00	29	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
30	70.00	30	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
31	75.00	31	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
32	80.00	32	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
33	82.00	33	0.400	0.790	1.	0.	144	STRUCTURE FRONT MI
34	84.00	34	0.400	0.790	1.	0.	144	STRUCTURE BACK MID
35	86.00	35	0.400	0.790	1.	0.	144	STRUCTURE RIGHT
36	88.00	36	0.400	0.790	1.	0.	144	STRUCTURE LEFT

S-F1Load/Save All S-F4Auto TM UDC Allowed ESCQuit
F1Load/Save Page F3PropLib F4AutoGen F5ImportPropFmt F6NewPropFile F10Search

PgDn PgUp Home End F2Help

ITAS Property Data Entry

Seq	Surface No	NodeNo	Alpha	Emiss	T/Mass	Dissip	MID	Comments
29	65.00	29	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
30	70.00	30	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
31	75.00	31	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
32	80.00	32	0.400	0.790	1.	0.	144	UPPER EQUIPMENT PL
33	82.00	33	0.400	0.790	1.	0.	144	STRUCTURE FRONT MI
34	84.00	34	0.400	0.790	1.	0.	144	STRUCTURE BACK MID
35	86.00	35	0.400	0.790	1.	0.	144	STRUCTURE RIGHT
36	88.00	36	0.400	0.790	1.	0.	144	STRUCTURE LEFT
37	92.00	37	0.400	0.790	1.	0.	144	RIGHT FRONT SLANT ;
38	94.00	38	0.400	0.790	1.	0.	144	RIGHT FRONT SLANT
39	96.00	39	0.400	0.790	1.	0.	144	BACK RIGHT SLANT
40	98.00	40	0.400	0.790	1.	0.	144	RIGHT BACK SLANT
41	99.01	41	0.400	0.790	1.	0.	144	EPS
42	99.02	42	0.400	0.790	1.	0.	144	EPS
43	99.03	43	0.400	0.790	1.	0.	144	EPS
44	99.04	44	0.400	0.790	1.	0.	144	EPS
45	99.05	45	0.400	0.790	1.	0.	144	EPS
46	99.06	46	0.400	0.790	1.	0.	144	EPS

S-F1Load/Save All S-F4Auto TM UDC Allowed ESCQuit

F1Load/Save Page F3PropLib F4AutoGen F5ImportPropFmt F6NewPropFile F10Search

PANSAT - TRANSIENT - SUNLIGHT ZONE - INTERNAL HEAT DISSIPATION - PASS

emperatures, degC

1	32.40	2	33.67	3	35.07	4	32.09	5	33.59	6
7	32.47	8	33.54	9	34.69	10	39.58	11	40.61	12
3	39.76	14	41.05	15	41.37	16	37.92	17	38.77	18
9	39.37	20	38.62	21	37.18	22	40.80	23	39.98	24
5	39.06	26	38.54	27	37.08	28	32.28	29	30.99	30
1	32.08	32	30.41	33	30.00	34	31.71	35	30.53	36
7	30.37	38	30.57	39	31.03	40	30.01	41	30.40	42
3	30.86	44	31.25	45	31.81	46	32.11	47	32.55	48
9	33.21	50	33.87	51	34.13	52	33.26	53	33.70	54
5	33.03	56	32.75	57	31.78	58	34.11	59	33.68	60
1	34.11	62	33.80	63	32.85	64	28.40	65	27.87	66
7	28.78	68	27.91	69	28.55	70	29.55	71	28.89	72
3	27.73	74	29.43	75	33.79	76	29.45	77	32.27	78
9	31.11	80	33.04	81	35.23	82	40.46	83	40.30	84
5	41.20	86	40.80	87	41.71	88	37.21	89	35.10	90
1	38.88	92	37.05	93	35.60	94	38.35	95	36.90	96
7	30.16	98	29.48	99	30.39	100	29.48	101	31.61	102
3	26.29	104	24.59	105	24.93	106	26.60	107	25.48	108
9	28.50	110	27.98	111	28.44	112	26.73	113	26.73	114
5	28.95	116	29.86	117	30.52	118	26.24	119	25.88	120
1	27.85	122	27.19	123	26.76	124	29.65	125	29.14	126
7	25.70	128	25.89	129	25.45	130	25.64	131	26.63	132
3	29.72	134	30.52	135	32.04	136	28.14	137	28.85	138
9	28.05	140	28.30	141	32.10	142	35.42	143	36.06	144
5	37.12	146	41.06	147	41.32	148	34.91	149	33.95	150
1	34.88	152	32.97	153	31.51	154	34.69	155	31.77	156
7	29.53	158	28.94	159	29.44	160	28.94	161	30.75	162
3	30.26	164	30.91	165	31.62	166	29.16	167	29.75	168
9	29.46	170	29.18	171	31.59	172	32.18	173	32.52	174
5	33.63	176	36.91	177	37.05	178	33.01	179	32.11	180
1	33.09	182	31.86	183	30.65	184	33.02	185	31.00	186
7	28.43	188	28.02	189	28.73	190	28.23	191	30.26	192
3	25.04	194	25.51	195	28.20	196	25.32	197	26.39	198
9	25.99	200	27.55	201	31.35	202	29.36	203	27.91	204
5	28.22	206	27.24	207	28.56	208	27.73	209	27.67	210
1	33.97	212	34.66	213	34.63	214	33.51	215	32.24	216
7	31.45	218	31.15	219	33.70	220	34.39	221	34.43	222
3	33.33	224	33.48	225	33.44	226	33.39	227	32.78	228
9	30.58	230	30.52	231	28.77	232	28.61			
1	-272.80									

PANSAT - TRANSIENT - SHADOW ZONE - INTERNAL HEAT DISSIPATION - PA

Temperatures, degC

1	29.93	2	30.88	3	31.83	4	29.32	5	30.44
7	30.08	8	30.85	9	31.66	10	33.00	11	33.64
13	33.67	14	34.77	15	35.60	16	32.55	17	33.56
19	33.64	20	33.04	21	31.97	22	34.48	23	33.54
25	33.96	26	33.09	27	31.99	28	29.65	29	28.59
31	29.66	32	28.44	33	28.27	34	29.57	35	28.79
37	30.28	38	30.75	39	31.22	40	29.99	41	30.63
43	30.77	44	31.38	45	31.91	46	32.44	47	32.83
49	33.37	50	34.00	51	34.25	52	33.25	53	33.66
55	33.23	56	32.94	57	31.97	58	34.26	59	33.84
61	34.21	62	33.93	63	32.98	64	28.56	65	27.97
67	28.95	68	28.07	69	28.38	70	29.67	71	28.99
73	24.95	74	26.06	75	28.75	76	26.75	77	29.08
79	28.75	80	30.26	81	31.09	82	29.42	83	29.52
85	30.26	86	30.81	87	31.24	88	30.37	89	29.63
91	31.86	92	31.57	93	30.88	94	32.42	95	32.12
97	25.67	98	25.50	99	25.41	100	25.33	101	26.88 1
103	25.04	104	24.21	105	24.73	106	25.75	107	25.58 1
109	27.92	110	28.13	111	28.74	112	26.58	113	26.76 1
115	29.25	116	30.62	117	30.90	118	25.99	119	25.53 1
121	27.98	122	27.30	123	26.85	124	29.88	125	29.35 1
127	24.68	128	24.63	129	25.13	130	25.13	131	26.53 1
133	28.85	134	29.98	135	30.14	136	27.17	137	27.61 1
139	27.11	140	26.83	141	27.67	142	30.15	143	30.95 1
145	29.18	146	27.85	147	27.92	148	31.26	149	30.80 1
151	29.86	152	29.29	153	28.08	154	28.63	155	28.18 1
157	27.54	158	27.46	159	26.82	160	26.90	161	26.93 1
163	30.13	164	31.00	165	31.55	166	28.82	167	29.84 1
169	28.68	170	29.32	171	31.50	172	31.67	173	32.01 1
175	32.24	176	36.36	177	36.47	178	32.95	179	32.13 1
181	32.83	182	31.96	183	30.78	184	32.92	185	31.11 1
187	28.45	188	27.85	189	28.67	190	27.96	191	30.00 1
193	23.23	194	22.92	195	24.73	196	22.97	197	23.03 1
199	23.42	200	23.94	201	26.55	202	29.35	203	27.73 2
205	28.20	206	26.93	207	27.28	208	27.49	209	27.03 2
211	32.31	212	32.69	213	32.56	214	32.18	215	31.74 2
217	31.56	218	31.32	219	32.66	220	33.00	221	32.89 2
223	32.82	224	33.13	225	33.10	226	32.81	227	32.29 2
229	30.60	230	30.64	231	28.51	232	28.55		
301	-272.80								

APPENDIX R. ITAS BATTERY THERMAL MASSES

èëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëESC:Quitëë

SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
1	-101	33.74	19.438	0	LOWER EQUIPMENT PLATE
2	-102	33.74	5.692	0	LOWER EQUIPMENT PLATE
3	-103	33.74	5.692	0	LOWER EQUIPMENT PLATE
4	-104	33.74	2.014	0	LOWER EQUIPMENT PLATE
5	-105	33.74	2.014	0	LOWER EQUIPMENT PLATE
6	-106	33.74	2.014	0	LOWER EQUIPMENT PLATE
7	-107	33.74	2.014	0	LOWER EQUIPMENT PLATE
8	201	30	2.169	0	BATTERY A
9	202	30	5.327	0	BATTERY A
10	203	30	3.3	0	BATTERY A
11	204	30	2.169	0	BATTERY A
12	205	30	5.327	0	BATTERY A
13	206	30	3.3	0	BATTERY A
14	301	30	3.805	0	DCS
15	302	30	6.342	0	DCS
16	303	30	7.610	0	DCS
17	304	30	3.805	0	DCS
18	305	30	6.342	0	DCS

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

èëCtrl:Copyëëëëëëë ITAS Node Data Entry For Thermal Analysis ëëëëëëëESC:Quitëë

SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
19	306	30	7.610	0	DCS
20	401	30	2.169	0	BATTERY B
21	402	30	5.327	0	BATTERY B
22	403	30	3.3	0	BATTERY B
23	404	30	2.169	0	BATTERY B
24	405	30	5.327	0	BATTERY B
25	406	30	3.3	0	BATTERY B
26	-501	33.08	9.719	0	UPPER EQUIPMENT PLATE
27	-502	33.08	2.846	0	UPPER EQUIPMENT PLATE
28	-503	33.08	2.846	0	UPPER EQUIPMENT PLATE
29	-504	33.08	1.068	0	UPPER EQUIPMENT PLATE
30	-505	33.08	1.068	0	UPPER EQUIPMENT PLATE
31	-506	33.08	1.068	0	UPPER EQUIPMENT PLATE
32	-507	33.08	1.068	0	UPPER EQUIPMENT PLATE
33	-601	33.44	2.014	0	PANSAT STRUCTURE
34	-602	39.87	2.014	0	PANSAT STRUCTURE
35	-603	38.83	2.014	0	PANSAT STRUCTURE
36	-604	31.14	2.014	0	PANSAT STRUCTURE

CTRL-F1Import ITAS_NC UDC Allowed PgDn PgUp Home End
SHFT-F1Import Column Shift-F5Del/Pur
F1Save/Purge F2Help F3AutoGen F4Purge F5Delete F7Mark/UnMark F10Search

eeCtrl:Copyeeeeeeee ITAS Node Data Entry For Thermal Analysis eeeeeeeeESC:Quitee

SEQN	NodeNo	Temp-C	ThrMass	Dissip	Comment
37	-605	30.79	2.014	0	PANSAT STRUCTURE
38	-606	33.26	2.014	0	PANSAT STRUCTURE
39	-607	33.26	2.014	0	PANSAT STRUCTURE
40	-608	28.56	2.014	0	PANSAT STRUCTURE
41	701	30	1.598	0	EPS
42	702	30	1.788	0	EPS
43	703	30	9.132	0	EPS
44	704	30	1.598	0	EPS
45	705	30	1.788	0	EPS
46	706	30	9.132	0	EPS
47	1500	30	0	1	HEAT DISSIPATION IN BATTERY A
48	1600	30	0	6.25	HEAT DISSIPATION IN DCS
49	1700	30	0	.5	HEAT DISSIPATION IN BATTERY B
50	1800	30	0	.5	HEAT DISSIPATION IN EPS

CTRL-F1Import ITAS_NC   UDC Allowed   PgDn PgUp Home End
SHFT-F1Import Column   Shift-F5Del/Pur
F1Save/Purge   F2Help F3AutoGen F4Purge F5Delete   F7Mark/UnMark F10Search

APPENDIX S. BATTERY THERMAL MASS CALCULATIONS

BATTERY THERMAL CAPACITANCES								
NODE	area	thickness	volume	ro-Al	c-Al	conv fact	in-m	thr mass
101	122.6	0.25	30.65	2787	0.199	69.78	61024	19.43797
102	35.9	0.25	8.975	2787	0.199	69.78	61024	5.691868
103	35.9	0.25	8.975	2787	0.199	69.78	61024	5.691868
104	12.7	0.25	3.175	2787	0.199	69.78	61024	2.013558
105	12.7	0.25	3.175	2787	0.199	69.78	61024	2.013558
106	12.7	0.25	3.175	2787	0.199	69.78	61024	2.013558
107	12.7	0.25	3.175	2787	0.199	69.78	61024	2.013558
201	17.1	0.2	3.42	2787	0.199	69.78	61024	2.168935
202	42	0.2	8.4	2787	0.199	69.78	61024	5.327208
203	26	0.2	5.2	2787	0.199	69.78	61024	3.297795
204	17.1	0.2	3.42	2787	0.199	69.78	61024	2.168935
205	42	0.2	8.4	2787	0.199	69.78	61024	5.327208
206	26	0.2	5.2	2787	0.199	69.78	61024	3.297795
301	30	0.2	6	2787	0.199	69.78	61024	3.805148
302	50	0.2	10	2787	0.199	69.78	61024	6.341914
303	60	0.2	12	2787	0.199	69.78	61024	7.610297
304	30	0.2	6	2787	0.199	69.78	61024	3.805148
305	50	0.2	10	2787	0.199	69.78	61024	6.341914
306	60	0.2	12	2787	0.199	69.78	61024	7.610297
401	17.1	0.2	3.42	2787	0.199	69.78	61024	2.168935
402	42	0.2	8.4	2787	0.199	69.78	61024	5.327208
403	26	0.2	5.2	2787	0.199	69.78	61024	3.297795
404	17.1	0.2	3.42	2787	0.199	69.78	61024	2.168935
405	42	0.2	8.4	2787	0.199	69.78	61024	5.327208
406	26	0.2	5.2	2787	0.199	69.78	61024	3.297795
501	122.6	0.125	15.325	2787	0.199	69.78	61024	9.718983
502	35.9	0.125	4.4875	2787	0.199	69.78	61024	2.845934
503	35.9	0.125	4.4875	2787	0.199	69.78	61024	2.845934
504	12.7	0.125	1.5875	2787	0.199	69.78	61024	1.006779
505	12.7	0.125	1.5875	2787	0.199	69.78	61024	1.006779
506	12.7	0.125	1.5875	2787	0.199	69.78	61024	1.006779
507	12.7	0.125	1.5875	2787	0.199	69.78	61024	1.006779
601	50.8	0.0625	3.175	2787	0.199	69.78	61024	2.013558
602	50.8	0.0625	3.175	2787	0.199	69.78	61024	2.013558

603	50.8	0.0625	3.175	2787	0.199	69.78	61024	2.013558
604	50.8	0.0625	3.175	2787	0.199	69.78	61024	2.013558
605	50.8	0.0625	3.175	2787	0.199	69.78	61024	2.013558
606	50.8	0.0625	3.175	2787	0.199	69.78	61024	2.013558
607	50.8	0.0625	3.175	2787	0.199	69.78	61024	2.013558
608	50.8	0.0625	3.175	2787	0.199	69.78	61024	2.013558
701	12.6	0.2	2.52	2787	0.199	69.78	61024	1.598162
702	14.1	0.2	2.82	2787	0.199	69.78	61024	1.78842
703	72	0.2	14.4	2787	0.199	69.78	61024	9.132356
704	12.6	0.2	2.52	2787	0.199	69.78	61024	1.598162
705	14.1	0.2	2.82	2787	0.199	69.78	61024	1.78842
706	72	0.2	14.4	2787	0.199	69.78	61024	9.132356

APPENDIX T. BATTERY CONDUCTANCE CALCULATIONS

BATTERY CONDUCTANCES							
From	To	width	th	area	length	k (Al)	conductance
201	202	5.25	0.2	1.05	5.625	4.31	0.804533333
201	205	5.25	0.2	1.05	5.625	4.31	0.804533333
201	203	3.25	0.2	0.65	6.625	4.31	0.422867925
201	206	3.25	0.2	0.65	6.625	4.31	0.422867925
202	204	3.25	0.2	0.65	6.625	4.31	0.422867925
202	203	8	0.2	1.6	4.25	4.31	1.622588235
202	206	8	0.2	1.6	4.25	4.31	1.622588235
203	205	8	0.2	1.6	4.25	4.31	1.622588235
203	204	3.25	0.2	0.65	6.625	4.31	0.422867925
204	206	3.25	0.2	0.65	6.625	4.31	0.422867925
204	205	3.25	0.2	0.65	5.625	4.31	0.498044444
205	206	8	0.2	1.6	4.25	4.31	1.622588235
301	302	5	0.2	1	8	4.31	0.53875
301	305	5	0.2	1	8	4.31	0.53875
301	303	6	0.2	1.2	7.5	4.31	0.6896
301	306	6	0.2	1.2	7.5	4.31	0.6896
302	304	5	0.2	1	8	4.31	0.53875
302	303	10	0.2	2	5.5	4.31	1.567272727
302	306	10	0.2	2	5.5	4.31	1.567272727
303	305	10	0.2	2	5.5	4.31	1.567272727
303	304	6	0.2	1.2	7.5	4.31	0.6896
304	306	6	0.2	1.2	7.5	4.31	0.6896
304	305	5	0.2	1	8	4.31	0.53875
305	306	10	0.2	2	5.5	4.31	1.567272727
401	402	5.25	0.2	1.05	5.625	4.31	0.804533333
401	405	5.25	0.2	1.05	5.625	4.31	0.804533333
401	403	3.25	0.2	0.65	6.625	4.31	0.422867925
401	406	3.25	0.2	0.65	6.625	4.31	0.422867925
402	404	3.25	0.2	0.65	6.625	4.31	0.422867925
402	403	8	0.2	1.6	4.25	4.31	1.622588235
402	406	8	0.2	1.6	4.25	4.31	1.622588235
403	405	8	0.2	1.6	4.25	4.31	1.622588235

403	404	3.25	0.2	0.65	6.625	4.31	0.422867925
404	406	3.25	0.2	0.65	6.625	4.31	0.422867925
404	405	5.25	0.2	1.05	5.625	4.31	0.804533333
405	406	8	0.2	1.6	4.25	4.31	1.622588235
1500	201			17.1	0.2	4.31	368.505
1500	202			42	0.2	4.31	905.1
1500	203			26	0.2	4.31	560.3
1500	204			17.1	0.2	4.31	368.505
1500	205			42	0.2	4.31	905.1
1500	206			26	0.2	4.31	560.3
1600	301			30	0.2	4.31	646.5
1600	302			50	0.2	4.31	1077.5
1600	303			60	0.2	4.31	1293
1600	304			30	0.2	4.31	646.5
1600	305			50	0.2	4.31	1077.5
1600	306			60	0.2	4.31	1293
1700	401			17.1	0.2	4.31	368.505
1700	402			42	0.2	4.31	905.1
1700	403			26	0.2	4.31	560.3
1700	404			17.1	0.2	4.31	368.505
1700	405			42	0.2	4.31	905.1
1700	406			26	0.2	4.31	560.3
206	102	3.25	7.13	23.1725	0.225	4.31	443.8821111
206	104	3.25	0.435	1.41375	0.225	4.31	27.08116667
206	105	3.25	0.435	1.41375	0.225	4.31	27.08116667
306	101	6	10	60	0.225	4.31	1149.333333
406	103	3.25	7.13	23.1725	0.225	4.31	443.8821111
406	106	3.25	0.435	1.41375	0.225	4.31	27.08116667
406	107	3.25	0.435	1.41375	0.225	4.31	27.08116667
703	501	7.13	7.13	50.8369	0.225	4.31	973.8090622
703	502	0.435	7.13	3.10155	0.225	4.31	59.41191333
703	503	0.435	7.13	3.10155	0.225	4.31	59.41191333
703	504	0.435	0.935	0.406725	0.225	4.31	7.791043333
703	505	0.435	0.935	0.406725	0.225	4.31	7.791043333
703	506	0.435	0.935	0.406725	0.225	4.31	7.791043333
703	507	0.435	0.935	0.406725	0.225	4.31	7.791043333

APPENDIX U. BATTERY MODEL CONDUCTOR DATA ENTRY

```
Ctrl:Copy  ITAS Conductor Data Entry  ESC:Quit

 SqNo FACTOR From   To     Cond. Value  L/R Description
    1 1       1      101    1000         L  GEOMETRY TO LOWER PLATE NODE
    2 1       2      102    1000         L  GEOMETRY TO LOWER PLATE NODE
    3 1       3      103    1000         L  GEOMETRY TO LOWER PLATE NODE
    4 1       4      104    1000         L  GEOMETRY TO LOWER PLATE NODE
    5 1       5      105    1000         L  GEOMETRY TO LOWER PLATE NODE
    6 1       6      106    1000         L  GEOMETRY TO LOWER PLATE NODE
    7 1       7      107    1000         L  GEOMETRY TO LOWER PLATE NODE
    8 1       8      201    1000         L  GEOMETRY TO BATTERY A NODE
    9 1       9      202    1000         L  GEOMETRY TO BATTERY A NODE
   10 1       10     203    1000         L  GEOMETRY TO BATTERY A NODE
   11 1       11     204    1000         L  GEOMETRY TO BATTERY A NODE
   12 1       12     205    1000         L  GEOMETRY TO BATTERY A NODE
   13 1       13     206    1000         L  GEOMETRY TO BATTERY A NODE
   14 1       14     301    1000         L  GEOMETRY TO DCS NODE
   15 1       15     302    1000         L  GEOMETRY TO DCS NODE
   16 1       16     303    1000         L  GEOMETRY TO DCS NODE
   17 1       17     304    1000         L  GEOMETRY TO DCS NODE
   18 1       18     305    1000         L  GEOMETRY TO DCS NODE
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur              End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

Ctrl:Copy  ITAS Conductor Data Entry  ESC:Quit

 SqNo FACTOR From   To     Cond. Value  L/R Description
   19 1       19     306    1000         L  GEOMETRY TO DCS NODE
   20 1       20     401    1000         L  GEOMETRY TO BATTERY B NODE
   21 1       21     402    1000         L  GEOMETRY TO BATTERY B NODE
   22 1       22     403    1000         L  GEOMETRY TO BATTERY B NODE
   23 1       23     404    1000         L  GEOMETRY TO BATTERY B NODE
   24 1       24     405    1000         L  GEOMETRY TO BATTERY B NODE
   25 1       25     406    1000         L  GEOMETRY TO BATTERY B NODE
   26 1       26     501    1000         L  GEOMETRY TO UPPER PLATE
   27 1       27     502    1000         L  GEOMETRY TO UPPER PLATE
   28 1       28     503    1000         L  GEOMETRY TO UPPER PLATE
   29 1       29     504    1000         L  GEOMETRY TO UPPER PLATE
   30 1       30     505    1000         L  GEOMETRY TO UPPER PLATE
   31 1       31     506    1000         L  GEOMETRY TO UPPER PLATE
   32 1       32     506    1000         L  GEOMETRY TO UPPER PLATE
   33 1       33     601    1000         L  GEOMETRY TO STRUCTURE NODE
   34 1       34     602    1000         L  GEOMETRY TO STRUCTURE NODE
   35 1       35     603    1000         L  GEOMETRY TO STRUCTURE NODE
   36 1       36     604    1000         L  GEOMETRY TO STRUCTURE NODE
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur              End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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ÈËË Ctrl:CopyËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËË ESC:Quit É
º                                                                            º
º SqNo FACTOR From   To     Cond. Value  L/R Description                     º
º   37 1      37     605    1000          L  GEOMETRY TO STRUCTURE NODE     º
º   38 1      38     606    1000          L  GEOMETRY TO STRUCTURE NODE     º
º   39 1      39     607    1000          L  GEOMETRY TO STRUCTURE NODE     º
º   40 1      40     608    1000          L  GEOMETRY TO STRUCTURE NODE     º
º   41 1      41     701    1000          L  GEOMETRY TO EPS NODE           º
º   42 1      42     702    1000          L  GEOMETRY TO EPS NODE           º
º   43 1      43     703    1000          L  GEOMETRY TO EPS NODE           º
º   44 1      44     704    1000          L  GEOMETRY TO EPS NODE           º
º   45 1      45     705    1000          L  GEOMETRY TO EPS NODE           º
º   46 1      46     706    1000          L  GEOMETRY TO EPS NODE           º
º   47 1      201    202    .80453        L  BATTERY A NODE TO NODE         º
º   48 1      201    205    .80453        L  BATTERY A NODE TO NODE         º
º   49 1      201    203    .42287        L  BATTERY A NODE TO NODE         º
º   50 1      201    206    .42287        L  BATTERY A NODE TO NODE         º
º   51 1      202    204    .42287        L  BATTERY A NODE TO NODE         º
º   52 1      202    203    1.62259       L  BATTERY A NODE TO NODE         º
º   53 1      202    206    1.62259       L  BATTERY A NODE TO NODE         º
º   54 1      203    205    1.62259       L  BATTERY A NODE TO NODE         º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ÈËË Ctrl:CopyËËËËËËËËËËËËË ITAS Conductor Data Entry ËËËËËËËËËËËËËË ESC:Quit É
º                                                                            º
º SqNo FACTOR From   To     Cond. Value  L/R Description                     º
º   55 1      203    204    .42287        L  BATTERY A NODE TO NODE         º
º   56 1      204    206    .42287        L  BATTERY A NODE TO NODE         º
º   57 1      204    205    .49804        L  BATTERY A NODE TO NODE         º
º   58 1      205    206    1.62259       L  BATTERY A NODE TO NODE         º
º   59 1      301    302    .53875        L  DCS NODE TO NODE               º
º   60 1      301    305    .53875        L  DCS NODE TO NODE               º
º   61 1      301    303    .6896         L  DCS NODE TO NODE               º
º   62 1      301    306    .6896         L  DCS NODE TO NODE               º
º   63 1      302    304    .53875        L  DCS NODE TO NODE               º
º   64 1      302    303    1.56727       L  DCS NODE TO NODE               º
º   65 1      302    306    1.56727       L  DCS NODE TO NODE               º
º   66 1      303    305    1.56727       L  DCS NODE TO NODE               º
º   67 1      303    304    .6896         L  DCS NODE TO NODE               º
º   68 1      304    306    .6896         L  DCS NODE TO NODE               º
º   69 1      304    305    .53875        L  DCS NODE TO NODE               º
º   70 1      305    306    1.56727       L  DCS NODE TO NODE               º
º   71 1      401    402    .80453        L  BATTERY B NODE TO NODE         º
º   72 1      401    405    .80453        L  BATTERY B NODE TO NODE         º
ÀËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËËÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                 End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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ÚÄÄÄ Ctrl:CopyÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ITAS Conductor Data Entry ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ESC:Quit ¿
³                                                                              ³
³ SqNo FACTOR From   To     Cond. Value  L/R Description                        ³
³   73 1      401    403    .42287        L  BATTERY B NODE TO NODE            ³
³   74 1      401    406    .42287        L  BATTERY B NODE TO NODE            ³
³   75 1      402    404    .42287        L  BATTERY B NODE TO NODE            ³
³   76 1      402    403    1.62259       L  BATTERY B NODE TO NODE            ³
³   77 1      402    406    1.62259       L  BATTERY B NODE TO NODE            ³
³   78 1      403    405    1.62259       L  BATTERY B NODE TO NODE            ³
³   79 1      403    404    .42287        L  BATTERY B NODE TO NODE            ³
³   80 1      404    406    .42287        L  BATTERY B NODE TO NODE            ³
³   81 1      404    405    .80453        L  BATTERY B NODE TO NODE            ³
³   82 1      405    406    1.62259       L  BATTERY B NODE TO NODE            ³
³   83 1      1500   201    368.5         L  HEAT NODE TO BATTERY A            ³
³   84 1      1500   202    950.1         L  HEAT NODE TO BATTERY A            ³
³   85 1      1500   203    560.3         L  HEAT NODE TO BATTERY A            ³
³   86 1      1500   204    368.5         L  HEAT NODE TO BATTERY A            ³
³   87 1      1500   205    950.1         L  HEAT NODE TO BATTERY A            ³
³   88 1      1500   206    560.3         L  HEAT NODE TO BATTERY A            ³
³   89 1      1600   301    646.5         L  HEAT NODE TO DCS                  ³
³   90 1      1600   302    1077.5        L  HEAT NODE TO DCS                  ³
ÀÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search

ÚÄÄÄ Ctrl:CopyÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ITAS Conductor Data Entry ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ ESC:Quit ¿
³                                                                              ³
³ SqNo FACTOR From   To     Cond. Value  L/R Description                        ³
³   91 1      1600   303    1293          L  HEAT NODE TO DCS                  ³
³   92 1      1600   304    646.5         L  HEAT NODE TO DCS                  ³
³   93 1      1600   305    1077.5        L  HEAT NODE TO DCS                  ³
³   94 1      1600   306    1293          L  HEAT NODE TO DCS                  ³
³   95 1      1700   401    368.51        L  HEAT NODE TO BATTERY B            ³
³   96 1      1700   402    905.1         L  HEAT NODE TO BATTERY B            ³
³   97 1      1700   403    560.3         L  HEAT NODE TO BATTERY B            ³
³   98 1      1700   404    368.51        L  HEAT NODE TO BATTERY B            ³
³   99 1      1700   405    905.1         L  HEAT NODE TO BATTERY B            ³
³  100 1      1700   406    560.3         L  HEAT NODE TO BATTERY B            ³
³  101 1      206    102    443.88        L  BATTERY A TO LOWER PLATE           ³
³  102 1      206    104    27.08         L  BATTERY A TO LOWER PLATE           ³
³  103 1      206    105    27.08         L  BATTERY A TO LOWER PLATE           ³
³  104 1      306    101    1149.3        L  DCS TO LOWER PLATE                 ³
³  105 1      406    103    443.88        L  BATTERY B TO LOWER PLATE           ³
³  106 1      406    106    27.08         L  BATTERY B TO LOWER PLATE           ³
³  107 1      406    107    27.08         L  BATTERY B TO LOWER PLATE           ³
³  108 1      703    501    973.81        L  EPS TO UPPER PLATE                 ³
ÀÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÙ
CTRL-F1Import ITAS_NC    ALT-F3AutoMLI   UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column   Shift-F3AutoCHT   Shift-F5Del/Pur                End
     F1Save/Purge     F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

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èëë Ctrl:Copyëëëëëëëëëëëëë ITAS Conductor Data Entry ëëëëëëëëëëëëëë ESC:Quit £
□                                                                              □
□ SqNo FACTOR From   To     Cond. Value  L/R Description                       □
□  109 1      703    502    27.08         L  EPS TO UPPER PLATE                □
□  110 1      703    503    27.08         L  EPS TO UPPER PLATE                □
□  111 1      703    504    7.791         L  EPS TO UPPER PLATE                □
□  112 1      703    505    7.791         L  EPS TO UPPER PLATE                □
□  113 1      703    506    7.791         L  EPS TO UPPER PLATE                □
□  114 1      703    507    7.791         L  EPS TO UPPER PLATE                □
□                                                                              □
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CTRL-F1Import ITAS_NC     ALT-F3AutoMLI    UDC Allowed              PgDn PgUp Home
SHFT-F1Import Column    Shift-F3AutoCHT   Shift-F5Del/Pur                 End
    F1Save/Purge       F2Help F3AutoGen F4Purge F5Delete  F7Mark/UnMark F10Search
```

APPENDIX V. BATTERY THERMAL ANALYSIS RESULTS

```
Öáááááááááááááááááááááááááááááááá PC-ITAS ááááááááááááááááááááááááááááááááááááá¿
°LINE NO.      1 to      18       RESULTS REVIEW                                   °
ááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááá¦
********************************************************************************
Date: 09/15/94                                                Time: 17:08:37.10
********************************************************************************
================================================================================
                        Thermal Analysis Parameters
================================================================================
 1.  Solution Method:1.Steady-State 2.Transient 3. (1&2).......         1
 2.  Solution Time Step ........(minutes)......................       0.10
 3.  Final Time (minutes);if <0 then no of orbs................      -1.00
 4.  Starting Temperature ......(Kelvin )......................     300.00
 5.  Temperature Print Interval (minutes)......................         20
 6.  No. of Iterations For Convergence (NLOOP).................       9999
 7.  Temperature Unit 1:K, 2:C, 3:F, 4:R.......................          2
 8.  Solution Accuracy Parameter (not used)....................        130
 9.  Solution Convergence Parameter (not used).................       1.30
 10. Solution Tolerance (ARLXCA, DRLXCA).......................    0.00100
 11. Transient Solution Stability Factor (not used)............      0.850
 12. Include User-Defined Network.......(Y/N)..................          Y

   Use PgDn PgUp Home End        F1Save   F10Search For   ESCQuit/Main Menu


Öáááááááááááááááááááááááááááááááá PC-ITAS ááááááááááááááááááááááááááááááááááááá¿
°LINE NO.     19 to      36       RESULTS REVIEW                                   °
ááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááá¦
 13. Print RADK, POWER..................(Y/N)..................          N
 14. Print Transient Time/Temperature...(Y/N)..................          N
 15. Starting Temperatures Forced (No.4)(Y/N)..................          N
 16. Thermal Analyses Without Orbital Loads (Y/N)..............          N
 17. Stand-Alone Thermal Analyzer (ITAS-Format Models).........          N
 18. No. of Isolated Cavities (RADK files)....................           0

================================================================================


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                           *ITAS THERMAL ANALYSIS*
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********************************************************************************
 ITAS ABSORBED HEAT RATES FROM ORBITAL INCIDENT & IR AND UV MARICES
********************************************************************************
********************************************************************************
Date: 09/15/94                                                Time: 17:08:37.10

   Use PgDn PgUp Home End        F1Save   F10Search For   ESCQuit/Main Menu
```

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Öááááááááááááááááááááááááááááááá PC-ITAS áááááááááááááááááááááááááááááááááááç
°LINE NO.      1 to      18      RESULTS REVIEW                              °
áááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááál
********************************************************************************
Date: 09/16/94                                               Time: 10:17:03.10
********************************************************************************
================================================================================
                      Thermal Analysis Parameters
================================================================================
 1.  Solution Method:1.Steady-State 2.Transient 3. (1&2).......          1
 2.  Solution Time Step ........(minutes).....................        0.10
 3.  Final Time (minutes);if <0 then no of orbs................       -1.00
 4.  Starting Temperature ......(Kelvin ).....................      300.00
 5.  Temperature Print Interval (minutes).....................          20
 6.  No. of Iterations For Convergence (NLOOP)................        9999
 7.  Temperature Unit 1:K, 2:C, 3:F, 4:R......................           2
 8.  Solution Accuracy Parameter (not used)...................         130
 9.  Solution Convergence Parameter (not used)................        1.30
 10. Solution Tolerance (ARLXCA, DRLXCA)......................     0.00100
 11. Transient Solution Stability Factor (not used)...........       0.850
 12. Include User-Defined Network.......(Y/N).................           Y

   Use PgDn PgUp Home End        F1Save   F10Search For    ESCQuit/Main Menu
```

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Öááááááááááááááááááááááááááááááá PC-ITAS áááááááááááááááááááááááááááááááááááç
°LINE NO.     19 to      36      RESULTS REVIEW                              °
áááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááál
 13. Print RADK, POWER.................(Y/N).................          N
 14. Print Transient Time/Temperature...(Y/N).................          N
 15. Starting Temperatures Forced (No.4)(Y/N).................          N
 16. Thermal Analyses Without Orbital Loads (Y/N).............          N
 17. Stand-Alone Thermal Analyzer (ITAS-Format Models).........         N
 18. No. of Isolated Cavities (RADK files)....................          0

================================================================================


/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\
                          *ITAS THERMAL ANALYSIS*
/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\
********************************************************************************
 ITAS ABSORBED HEAT RATES FROM ORBITAL INCIDENT & IR AND UV MARICES
********************************************************************************
********************************************************************************
Date: 09/16/94                                               Time: 10:17:04.10

   Use PgDn PgUp Home End        F1Save   F10Search For    ESCQuit/Main Menu
```

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Öáááááááááááááááááááááááááááááááá PC-ITAS ááááááááááááááááááááááááááááááááááá¢
°LINE NO.   1423 to   1440       RESULTS REVIEW                                  °
ááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááá1
 CHECKOUT PHASE OF PC-ITAS THERMAL ANALYSIS

 TOTAL CARDS ENCOUNTERED:   2092
 TOTAL THERMAL MASSES USED (W-Min/C)=     7102.07
 TOTAL THERMAL MASSES USED (BTU/F  )=     224.440
=================================================================================
 NO. OF THERMAL NODES=            96

 ITAS STEADY-STATE SOLUTION ALGORITHM (SUCCESSIVE POINT ITERATION) PARAMETERS:
 ARLXCA=0.10000E-02, DRLXCA=0.10000E-02 NLOOP=  9999
*********************************************************************************
 ITAS STEADY-STATE SOLUTION (SUCCESSIVE POINT ITERATION)
 NO. OF ITERATIONS=   68 TOTAL INPUT ENERGY (W)=  9.6800
 SYSTEM ENERGY BALANCE (W)=  5.1598      (  53.303    %)
*********************************************************************************
 T      1=     33.71 T      2=     33.73 T      3=     33.73 T      4=     33.74
 T      5=     33.74 T      6=     33.74 T      7=     33.74 T      8=     33.69
 T      9=     33.68 T     10=     33.69 T     11=     33.69 T     12=     33.69

   Use PgDn PgUp Home End         F1Save    F10Search For    ESCQuit/Main Menu
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Öáááááááááááááááááááááááááááááááá PC-ITAS ááááááááááááááááááááááááááááááááááá¢
°LINE NO.   1441 to   1458       RESULTS REVIEW                                  °
ááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááá1
 T     13=     33.69 T     14=     33.72 T     15=     33.72 T     16=     33.72
 T     17=     33.72 T     18=     33.72 T     19=     33.69 T     20=     33.70
 T     21=     33.70 T     22=     33.70 T     23=     33.70 T     24=     33.69
 T     25=     33.69 T     26=     33.08 T     27=     33.08 T     28=     33.08
 T     29=     33.08 T     30=     33.08 T     31=     33.08 T     32=     33.08
 T     33=     33.44 T     34=     39.87 T     35=     38.83 T     36=     31.14
 T     37=     30.79 T     38=     33.26 T     39=     33.26 T     40=     28.56
 T     41=     33.00 T     42=     33.00 T     43=     33.97 T     44=     33.00
 T     45=     33.00 T     46=     33.97 T     47=   -273.16 T    101=     33.74
 T    102=     33.74 T    103=     33.74 T    104=     33.74 T    105=     33.74
 T    106=     33.74 T    107=     33.74 T    201=     33.69 T    202=     33.69
 T    203=     33.69 T    204=     33.69 T    205=     33.69 T    206=     33.70
 T    301=     33.72 T    302=     33.72 T    303=     33.72 T    304=     33.72
 T    305=     33.72 T    306=     33.72 T    401=     33.70 T    402=     33.70
 T    403=     33.70 T    404=     33.70 T    405=     33.69 T    406=     33.71
 T    501=     33.08 T    502=     33.08 T    503=     33.08 T    504=     33.08
 T    505=     33.08 T    506=     33.08 T    507=     33.08 T    601=     33.44
 T    602=     39.87 T    603=     38.83 T    604=     31.14 T    605=     30.79

   Use PgDn PgUp Home End         F1Save    F10Search For    ESCQuit/Main Menu
```

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Öááááááááááááááááááááááááááááááááá PC-ITAS ááááááááááááááááááááááááááááááááááááác
°LINE NO.   1459 to   1476       RESULTS REVIEW                                       °
âáááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááì
 T   606=     33.26 T   607=     33.26 T   608=     28.56 T   701=     33.00
 T   702=     33.00 T   703=     34.00 T   704=     33.00 T   705=     33.00
 T   706=     34.00 T  1500=     33.69 T  1600=     33.72 T  1700=     33.70

                    ASCENDING NODE NUMBER : TEMPERATURE
*******************************************************************************
 ITAS STEADY-STATE SOLUTION (SUCCESSIVE POINT ITERATION)
 NO. OF ITERATIONS=   68 TOTAL INPUT ENERGY (W)=  9.6800
 SYSTEM ENERGY BALANCE (W)=  5.1598      (  53.303    %)
*******************************************************************************
 T      1=     33.710 T      2=     33.730 T      3=     33.730 T      4=     33.739
 T      5=     33.739 T      6=     33.739 T      7=     33.739 T      8=     33.688
 T      9=     33.684 T     10=     33.688 T     11=     33.688 T     12=     33.687
 T     13=     33.689 T     14=     33.721 T     15=     33.716 T     16=     33.722
 T     17=     33.722 T     18=     33.716 T     19=     33.691 T     20=     33.695
 T     21=     33.697 T     22=     33.696 T     23=     33.696 T     24=     33.692
 T     25=     33.693 T     26=     33.080 T     27=     33.080 T     28=     33.080
 T     29=     33.080 T     30=     33.080 T     31=     33.080 T     32=     33.080

   Use PgDn PgUp Home End        F1Save    F10Search For    ESCQuit/Main Menu
```

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Öááááááááááááááááááááááááááááááááá PC-ITAS ááááááááááááááááááááááááááááááááááááác
°LINE NO.   1477 to   1494       RESULTS REVIEW                                       °
âáááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááááì
 T     33=     33.439 T     34=     39.867 T     35=     38.828 T     36=     31.140
 T     37=     30.790 T     38=     33.259 T     39=     33.260 T     40=     28.561
 T     41=     32.996 T     42=     32.996 T     43=     33.972 T     44=     32.996
 T     45=     32.996 T     46=     33.966 T     47=   -273.159 T    101=     33.740
 T    102=     33.740 T    103=     33.740 T    104=     33.740 T    105=     33.740
 T    106=     33.740 T    107=     33.740 T    201=     33.689 T    202=     33.687
 T    203=     33.689 T    204=     33.688 T    205=     33.688 T    206=     33.702
 T    301=     33.722 T    302=     33.719 T    303=     33.722 T    304=     33.722
 T    305=     33.719 T    306=     33.719 T    401=     33.696 T    402=     33.697
 T    403=     33.697 T    404=     33.697 T    405=     33.695 T    406=     33.706
 T    501=     33.080 T    502=     33.080 T    503=     33.080 T    504=     33.080
 T    505=     33.080 T    506=     33.080 T    507=     33.080 T    601=     33.440
 T    602=     39.870 T    603=     38.830 T    604=     31.140 T    605=     30.790
 T    606=     33.260 T    607=     33.260 T    608=     28.560 T    701=     33.000
 T    702=     33.000 T    703=     34.000 T    704=     33.000 T    705=     33.000
 T    706=     34.000 T   1500=     33.691 T   1600=     33.722 T   1700=     33.698
                    ASCENDING NODE NUMBER : IMPRESSED Q
 Q      1=      0.000 Q      2=      0.000 Q      3=      0.000 Q      4=      0.000

   Use PgDn PgUp Home End        F1Save    F10Search For    ESCQuit/Main Menu
```

PgDn PgUp Home End ITAS Time ( ) / Temperature ( ) Results

Temp	Node					Plot Flags (X or Y)	
Time	103	104	105	106	107	201	202
63.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
65.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
67.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
69.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
71.95	33.74	33.74	33.74	33.74	33.74	33.72	33.71
73.95	33.74	33.74	33.74	33.74	33.74	33.72	33.71
75.95	33.74	33.74	33.74	33.74	33.74	33.72	33.71
77.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
79.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
81.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
83.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
85.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
87.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
89.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
91.95	33.74	33.74	33.74	33.74	33.74	33.71	33.71
92.33	33.74	33.74	33.74	33.74	33.74	33.71	33.71
92.33	33.74	33.74	33.74	33.74	33.74	33.71	33.71

S-F3Save ASCII

F1Plot F2Help F3Save Binary F4SelPlot F8PageLeft F9PageRight ESCQuit

PgDn PgUp Home End ITAS Time ( ) / Temperature ( ) Results

Temp	Node					Plot Flags (X or Y)	
Time	203	204	205	206	301	302	303
63.95	33.71	33.71	33.71	33.71	33.72	33.72	33.72
65.95	33.71	33.71	33.71	33.72	33.72	33.72	33.72
67.95	33.71	33.71	33.71	33.72	33.73	33.72	33.73
69.95	33.72	33.71	33.71	33.72	33.73	33.73	33.73
71.95	33.72	33.72	33.72	33.72	33.73	33.73	33.73
73.95	33.72	33.72	33.72	33.72	33.73	33.73	33.73
75.95	33.72	33.72	33.71	33.72	33.73	33.72	33.73
77.95	33.71	33.71	33.71	33.71	33.72	33.72	33.73
79.95	33.71	33.71	33.71	33.71	33.72	33.72	33.72
81.95	33.71	33.71	33.71	33.71	33.72	33.72	33.72
83.95	33.71	33.71	33.71	33.71	33.72	33.72	33.72
85.95	33.71	33.71	33.71	33.71	33.72	33.72	33.72
87.95	33.71	33.71	33.71	33.71	33.72	33.72	33.72
89.95	33.71	33.71	33.71	33.71	33.72	33.72	33.72
91.95	33.71	33.71	33.71	33.71	33.72	33.72	33.72
92.33	33.71	33.71	33.71	33.71	33.72	33.72	33.72
92.33	33.71	33.71	33.71	33.71	33.72	33.72	33.72

S-F3Save ASCII

F1Plot F2Help F3Save Binary F4SelPlot F8PageLeft F9PageRight ESCQuit

PgDn PgUp Home End ITAS Time ( ) / Temperature ( ) Results

Temp	Node						
						Plot Flags (X or Y)	
Time	304	305	306	401	402	403	404
63.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
65.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
67.95	33.73	33.72	33.73	33.71	33.72	33.71	33.71
69.95	33.73	33.73	33.73	33.72	33.72	33.72	33.72
71.95	33.73	33.73	33.73	33.72	33.72	33.72	33.72
73.95	33.73	33.73	33.73	33.72	33.72	33.72	33.72
75.95	33.73	33.72	33.72	33.72	33.72	33.72	33.72
77.95	33.73	33.72	33.72	33.71	33.72	33.72	33.72
79.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
81.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
83.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
85.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
87.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
89.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
91.95	33.72	33.72	33.72	33.71	33.71	33.71	33.71
92.33	33.72	33.72	33.72	33.71	33.71	33.71	33.71
92.33	33.72	33.72	33.72	33.71	33.71	33.71	33.71

S-F3Save ASCII

F1Plot F2Help F3Save Binary F4SelPlot F8PageLeft F9PageRight ESCQuit

PgDn PgUp Home End ITAS Time ( ) / Temperature ( ) Results

Temp	Node						
						Plot Flags (X or Y)	
Time	405	406	501	502	503	504	505
63.95	33.71	33.71	33.08	33.08	33.08	33.08	33.08
65.95	33.71	33.72	33.08	33.08	33.08	33.08	33.08
67.95	33.71	33.72	33.08	33.08	33.08	33.08	33.08
69.95	33.71	33.72	33.08	33.08	33.08	33.08	33.08
71.95	33.72	33.72	33.08	33.08	33.08	33.08	33.08
73.95	33.72	33.72	33.08	33.08	33.08	33.08	33.08
75.95	33.72	33.72	33.08	33.08	33.08	33.08	33.08
77.95	33.71	33.72	33.08	33.08	33.08	33.08	33.08
79.95	33.71	33.71	33.08	33.08	33.08	33.08	33.08
81.95	33.71	33.71	33.08	33.08	33.08	33.08	33.08
83.95	33.71	33.71	33.08	33.08	33.08	33.08	33.08
85.95	33.71	33.71	33.08	33.08	33.08	33.08	33.08
87.95	33.71	33.71	33.08	33.08	33.08	33.08	33.08
89.95	33.71	33.71	33.08	33.08	33.08	33.08	33.08
91.95	33.71	33.71	33.08	33.08	33.08	33.08	33.08
92.33	33.71	33.71	33.08	33.08	33.08	33.08	33.08
92.33	33.71	33.71	33.08	33.08	33.08	33.08	33.08

S-F3Save ASCII

F1Plot F2Help F3Save Binary F4SelPlot F8PageLeft F9PageRight ESCQuit

```
ÖääääääääääääääääääääääääääääääääPC-ITAS ääääääääääääääääääääääääääääääääääääää¢
•LINE NO.      1 to      18      RESULTS REVIEW                                 •
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ´
 TOTAL SURFACES IN THIS MODEL=   46
********************************************************************************
                         PC-ITAS Summary of Input Parameters
          These parameters reflect the latest values assigned to them
                             prior to any computation
********************************************************************************
Date: 09/17/94                                                 Time: 18:30:45.10
********************************************************************************
================================================================================
                          Thermal Analysis Parameters
================================================================================
 1.  Solution Method:1.Steady-State 2.Transient 3. (1&2).......         2
 2.  Solution Time Step ........(minutes).....................      0.10
 3.  Final Time (minutes);if <0 then no of orbs...............     -1.00
 4.  Starting Temperature ......(Kelvin )......................    300.00
 5.  Temperature Print Interval (minutes)......................        20
 6.  No. of Iterations For Convergence (NLOOP)................      9999
 7.  Temperature Unit 1:K, 2:C, 3:F, 4:R.......................         2

   Use PgDn PgUp Home End        F1Save   F10Search For   ESCQuit/Main Menu
```

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ÖääääääääääääääääääääääääääääääääPC-ITAS ääääääääääääääääääääääääääääääääääääää¢
•LINE NO.     19 to      36      RESULTS REVIEW                                 •
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ´
 8.  Solution Accuracy Parameter (not used)...................       1:0
 9.  Solution Convergence Parameter (not used)................      1.30
 10. Solution Tolerance (ARLXCA, DRLXCA).......................   0.00100
 11. Transient Solution Stability Factor (not used)...........     0.850
 12. Include User-Defined Network.......(Y/N)..................         Y
 13. Print RADK, POWER..................(Y/N)..................         N
 14. Print Transient Time/Temperature...(Y/N)..................         N
 15. Starting Temperatures Forced (No.4)(Y/N)..................         N
 16. Thermal Analyses Without Orbital Loads (Y/N).............         N
 17. Stand-Alone Thermal Analyzer (ITAS-Format Models).........        N
 18. No. of Isolated Cavities (RADK files).....................         0

================================================================================

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                            *ITAS THERMAL ANALYSIS*
/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\/\

   Use PgDn PgUp Home End        F1Save   F10Search For   ESCQuit/Main Menu
```

PgDn PgUp Home End ITAS Time ( ) / Temperature ( ) Results ^^

Temp	Node						Plot Flags (X or Y)
Time	8	9	10	11	12	13	14
0.00	26.84	26.84	26.84	26.84	26.84	26.84	26.84
1.95	26.93	26.93	26.94	26.93	26.94	27.10	26.99
3.95	27.06	27.06	27.06	27.06	27.07	27.23	27.19
5.95	27.18	27.18	27.19	27.18	27.19	27.35	27.37
7.95	27.30	27.31	27.31	27.30	27.31	27.47	27.56
9.95	27.42	27.42	27.43	27.42	27.43	27.58	27.73
11.95	27.54	27.54	27.54	27.54	27.54	27.69	27.91
13.95	27.65	27.65	27.65	27.65	27.66	27.80	28.07
15.95	27.76	27.76	27.77	27.76	27.77	27.91	28.23
17.95	27.87	27.87	27.88	27.87	27.88	28.02	28.39
19.95	27.98	27.98	27.98	27.98	27.98	28.12	28.54
21.95	28.08	28.08	28.09	28.08	28.09	28.22	28.68
23.95	28.19	28.19	28.19	28.19	28.19	28.32	28.82
25.95	28.29	28.29	28.29	28.29	28.29	28.42	28.96
27.95	28.38	28.39	28.39	28.38	28.39	28.51	29.09
29.95	28.48	28.48	28.48	28.48	28.49	28.61	29.22
31.95	28.57	28.58	28.58	28.57	28.58	28.70	29.34

S-F3Save ASCII

F1Plot F2Help F3Save Binary F4SelPlot F8PageLeft F9PageRight ESCQuit

PgDn PgUp Home End ITAS Time ( ) / Temperature ( ) Results ^^

Temp	Node						
						Plot Flags (X or Y)	
Time	15	16	17	18	19	20	21
0.00	26.84	26.84	26.84	26.84	26.84	26.84	26.84
1.95	26.99	27.00	26.99	26.99	27.15	26.93	26.94
3.95	27.18	27.19	27.19	27.18	27.34	27.06	27.07
5.95	27.37	27.38	27.38	27.37	27.52	27.18	27.19
7.95	27.55	27.56	27.56	27.55	27.70	27.30	27.31
9.95	27.73	27.74	27.73	27.73	27.87	27.42	27.43
11.95	27.90	27.91	27.91	27.90	28.04	27.54	27.55
13.95	28.07	28.08	28.07	28.07	28.20	27.65	27.66
15.95	28.23	28.24	28.23	28.23	28.35	27.77	27.77
17.95	28.38	28.39	28.39	28.38	28.50	27.88	27.88
19.95	28.53	28.54	28.54	28.53	28.65	27.98	27.99
21.95	28.68	28.69	28.68	28.68	28.79	28.09	28.10
23.95	28.82	28.83	28.82	28.82	28.93	28.19	28.20
25.95	28.96	28.96	28.96	28.96	29.06	28.29	28.30
27.95	29.09	29.10	29.09	29.09	29.19	28.39	28.40
29.95	29.22	29.22	29.22	29.22	29.31	28.49	28.49
31.95	29.34	29.35	29.34	29.34	29.43	28.58	28.59

S-F3Save ASCII

F1Plot F2Help F3Save Binary F4SelPlot F8PageLeft F9PageRight ESCQuit

PgDn PgUp Home End ITAS Time ( ) / Temperature ( ) Results

Tempáááá¢	ÖááNode						Öáááááááá Plot Flags (X or Y)
Time	22	23	24	25	26	27	28
0.00	26.84	26.84	26.84	26.84	26.84	26.84	26.84
1.95	26.94	26.93	26.93	27.10	33.08	33.08	33.08
3.95	27.06	27.06	27.06	27.23	33.08	33.08	33.08
5.95	27.19	27.18	27.18	27.35	33.08	33.08	33.08
7.95	27.31	27.31	27.31	27.47	33.08	33.08	33.08
9.95	27.43	27.42	27.43	27.58	33.08	33.08	33.08
11.95	27.54	27.54	27.54	27.70	33.08	33.08	33.08
13.95	27.66	27.66	27.66	27.81	33.08	33.08	33.08
15.95	27.77	27.77	27.77	27.91	33.08	33.08	33.08
17.95	27.88	27.88	27.88	28.02	33.08	33.08	33.08
19.95	27.99	27.98	27.98	28.12	33.08	33.08	33.08
21.95	28.09	28.09	28.09	28.23	33.08	33.08	33.08
23.95	28.19	28.19	28.19	28.33	33.08	33.08	33.08
25.95	28.29	28.29	28.29	28.42	33.08	33.08	33.08
27.95	28.39	28.39	28.39	28.52	33.08	33.08	33.08
29.95	28.49	28.49	28.49	28.61	33.08	33.08	33.08
31.95	28.58	28.58	28.58	28.70	33.08	33.08	33.08

S-F3Save ASCII

F1Plot F2Help F3Save Binary F4SelPlot F8PageLeft F9PageRight ESCQuit

PgDn PgUp Home End ITAS Time ( ) / Temperature ( ) Results

Time	8	9	10	11	12	13	14
0.00	30.67	30.67	30.67	30.67	30.67	30.73	31.73
1.95	30.68	30.67	30.68	30.67	30.68	30.73	31.74
3.95	30.68	30.66	30.68	30.68	30.68	30.73	31.74
5.95	30.68	30.66	30.69	30.68	30.68	30.72	31.75
7.95	30.69	30.66	30.69	30.68	30.68	30.72	31.75
9.95	30.69	30.66	30.70	30.69	30.68	30.72	31.75
11.95	30.70	30.66	30.70	30.69	30.69	30.72	31.76
13.95	30.70	30.66	30.70	30.69	30.69	30.72	31.76
15.95	30.70	30.66	30.71	30.69	30.69	30.72	31.76
17.95	30.70	30.66	30.71	30.70	30.69	30.72	31.76
19.95	30.71	30.66	30.71	30.70	30.69	30.72	31.76
21.95	30.71	30.66	30.71	30.70	30.70	30.72	31.76
23.95	30.71	30.66	30.72	30.70	30.70	30.72	31.76
25.95	30.71	30.66	30.72	30.70	30.70	30.72	31.76
27.95	30.71	30.66	30.72	30.70	30.70	30.72	31.76
29.95	30.72	30.66	30.72	30.71	30.70	30.72	31.76
31.95	30.72	30.66	30.72	30.71	30.70	30.73	31.76

Node Plot Flags (X or Y)

S-F3Save ASCII

F1Plot F2Help F3Save Binary F4SelPlot F8PageLeft F9PageRight ESCQuit

PgDn PgUp Home End ITAS Time ( ) / Temperature ( ) Results

Temp	Node						Plot Flags (X or Y)
Time	15	16	17	18	19	20	21
0.00	31.72	31.73	31.73	31.72	31.74	30.68	30.69
1.95	31.72	31.74	31.74	31.72	31.71	30.69	30.70
3.95	31.72	31.75	31.75	31.72	31.69	30.69	30.70
5.95	31.71	31.76	31.75	31.71	31.67	30.69	30.71
7.95	31.71	31.76	31.76	31.71	31.65	30.70	30.71
9.95	31.71	31.77	31.76	31.71	31.64	30.70	30.72
11.95	31.70	31.77	31.77	31.70	31.63	30.70	30.72
13.95	31.70	31.77	31.77	31.70	31.62	30.70	30.73
15.95	31.70	31.78	31.77	31.70	31.61	30.71	30.73
17.95	31.70	31.78	31.77	31.70	31.61	30.71	30.73
19.95	31.69	31.78	31.78	31.69	31.60	30.71	30.74
21.95	31.69	31.78	31.78	31.69	31.60	30.71	30.74
23.95	31.69	31.78	31.78	31.69	31.59	30.72	30.74
25.95	31.69	31.78	31.78	31.69	31.59	30.72	30.75
27.95	31.68	31.78	31.78	31.68	31.59	30.72	30.75
29.95	31.68	31.78	31.78	31.68	31.58	30.72	30.75
31.95	31.68	31.78	31.78	31.68	31.58	30.73	30.75

S-F3Save ASCII

F1Plot F2Help F3Save Binary F4SelPlot F8PageLeft F9PageRight ESCQuit

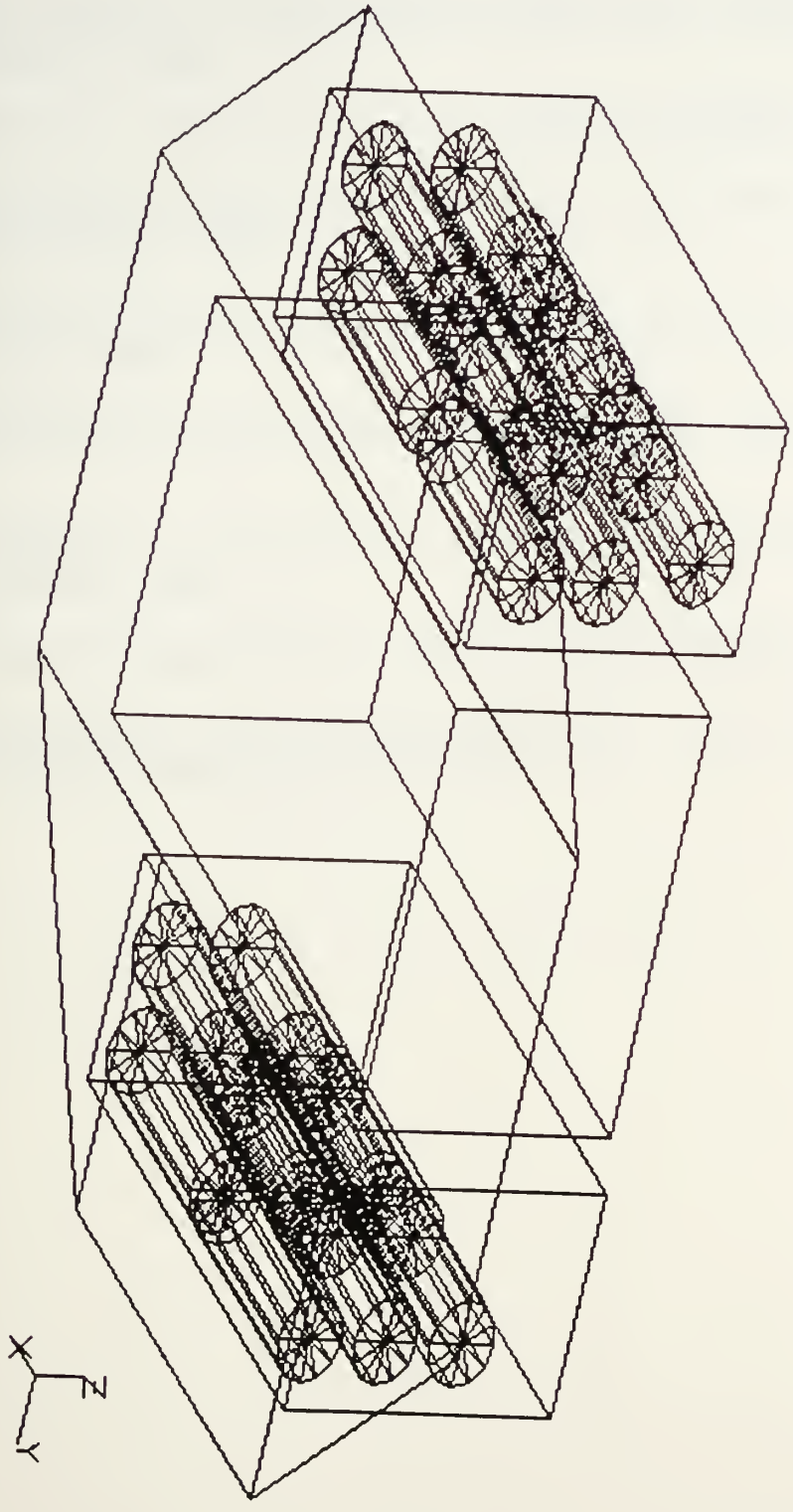
PgDn PgUp Home End ITAS Time ( ) / Temperature ( ) Results

Temp	Node						Plot Flags (X or Y)
Time	22	23	24	25	26	27	28
0.00	30.68	30.68	30.68	30.74	33.08	33.08	33.08
1.95	30.69	30.69	30.68	30.74	33.08	33.08	33.08
3.95	30.70	30.70	30.67	30.74	33.08	33.08	33.08
5.95	30.70	30.70	30.67	30.73	33.08	33.08	33.08
7.95	30.71	30.70	30.67	30.73	33.08	33.08	33.08
9.95	30.71	30.71	30.67	30.73	33.08	33.08	33.08
11.95	30.71	30.71	30.67	30.73	33.08	33.08	33.08
13.95	30.72	30.72	30.67	30.73	33.08	33.08	33.08
15.95	30.72	30.72	30.67	30.73	33.08	33.08	33.08
17.95	30.72	30.72	30.67	30.73	33.08	33.08	33.08
19.95	30.73	30.73	30.67	30.73	33.08	33.08	33.08
21.95	30.73	30.73	30.67	30.73	33.08	33.08	33.08
23.95	30.73	30.73	30.67	30.73	33.08	33.08	33.08
25.95	30.74	30.74	30.67	30.73	33.08	33.08	33.08
27.95	30.74	30.74	30.67	30.74	33.08	33.08	33.08
29.95	30.74	30.74	30.67	30.74	33.08	33.08	33.08
31.95	30.74	30.74	30.68	30.74	33.08	33.08	33.08

S-F3Save ASCII

F1Plot F2Help F3Save Binary F4SelPlot F8PageLeft F9PageRight ESCQuit

APPENDIX W. BATTERY THERMAL MODEL (INWARD VIEWING)



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